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Research Project Title: A GIS Based Planning Support System for Inclusionary Housing Profitability Optimisation in Cape Town, South Africa

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Abstract

Apartheid era legislation, along with automobile-oriented city planning practices, have left legacies of race/class-linked spatial inequality, and unsustainable land-use transport inter-relationships in post-Apartheid South African cities. Most poor urban communities still live in peripheral settlements, which are far from employment, education, and social opportunities. Consequently, these communities are reliant on public transit services which are inadequate and often unsafe. Despite substantial democratic era public transit investment, this automobile-oriented spatial legacy, rapid urbanisation and a growing middle class have contributed to increased automobile ownership and severe traffic congestion. This, along with inner-city and surrounding precinct regeneration programmes, guided by neo-liberal market-friendly agendas, have contributed towards gentrification and consequent displacement of poorer communities from the few remaining central, but previously affordable, precincts. Intervention is required to halt this trend, and to enable poorer communities' return to central urban neighbourhoods. Inclusionary housing in private sector housing developments could be one such intervention.

Since 2007, national and municipal authorities have devoted resources to developing inclusionary housing policies; over a decade later, none have progressed beyond draft state. A core challenge has been establishing mechanisms that ensure sufficient flexibility to accommodate widely differing market conditions between precincts. Decisions by local authorities/private property developers to grant concessions/pursue projects are influenced by constraining factors applicable to the particular land parcels considered. The ease and rigour of such decision-making at both a policy and implementation level could arguably be enhanced by a GIS (geographic information system) based PSS (planning support system), that is capable of analysing spatial and non-spatial factors on multiple land parcels. This could enable a comparison of the impact that concessions (in exchange for inclusion of affordable units) may have on the financial viability of projects.

The research objective of this dissertation was to establish the technical feasibility of developing such a GIS-based inclusionary housing profitability assessment PSS, capable of utilising existing GIS data (maintained by City of Cape Town metropolitan municipality), and which is capable of aiding local authorities and property developers, and ultimately, low-income communities. In conducting this research, a system intending to meet this objective was developed. Through engagement with stakeholders, five case study sites were identified. These were analysed using the system, allowing assessment of their suitability for inclusionary housing, while also allowing for the performance of the system itself to be evaluated.

Case study findings suggest that moderately wealthy neighbourhoods are best suited to inclusionary housing projects, as the impact of cross-subsidisation appeared strongest. Project viability was found to be highly sensitive to market conditions, highlighting the importance of using accurate and up-to-date market data. Ultimately, it was concluded that stakeholders see value in the development of a GIS based inclusionary housing PSS, but for the system to truly meet its objective of aiding inclusionary housing policy development and implementation decisions, additional functionality would be required.

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Glossary of Terms

Dwelling Unit:	“A unit containing one or more habitable rooms and provided with adequate sanitary and cook facilities” (SABS 0400-1990, 1990)
Generated Equity:	Value of completed construction, minus value of portion of building sold, minus debt to fund project
Inclusionary Housing:	<i>“Inclusionary housing in South Africa means the harnessing of private initiative in its pursuit of housing delivery to middle/higher income households to also provide (include) affordable housing opportunities in order to achieve a better socio-economic balance in residential developments and also contribute to the supply of affordable housing” (NDoH, 2007)</i>
Income Cliff:	Income difference between higher and lower earners across society
New Urbanism:	<i>“The movement towards a city where there is more emphasis on transit, with inherently much less travel needed through higher densities and mixed land use” (Newman & Kenworthy, 1996)</i>
Peak to Base Ratio:	The ratio between the peak and off-peak demand on a public transport service
Planning Support System:	<i>“geo-technology related instruments consisting of theories, information, methods, tools, data, et cetera dedicated for support of specific professional planning tasks” (Geertman, 2002)</i>
Rental Yield:	Annual rental income minus annual expenses, divided by generated equity
Transit Oriented Development:	<i>“TOD refers to compact, mixed-use, pedestrian friendly development that is ‘oriented’, and not just adjacent to, urban rail and busway stations” (Cervero, 2013)</i>

Abbreviations

AHI:	Assisted Housing Inventory
AHS:	Affordable Housing Suitability Model
BNG:	Breaking New Ground
CBD:	Central Business District
CCTV:	Closed Circuit Television
CID:	City Improvement District
CSIR:	Council for Scientific and Industrial Research
CSV:	Comma-Separated Values (generic tabular/spreadsheet file type)
DU:	Dwelling Unit
GIS:	Geographic Information System
IHP:	Inclusionary Housing Policy
MSA:	Moving South Africa
NDoH:	National Department of Housing
NDoT:	National Department of Transport
NMT:	None Motorised Transport
NPO:	Non-Profit Organisation
OD:	Trip Origin and Destination
PSS:	Planning Support System
PT:	Public Transit
RDP:	Reconstruction and Development Programme
SARS:	South African Revenue Service
SHI:	Social Housing Institutions
SPLUMA:	Spatial Planning and Land Use Management Act
SMCA:	Spatial Multi-Criteria Analysis
TOD:	Transit Oriented Development
TPC:	Town Planning Compliant
UDZ:	Urban Development Zone
VKT:	Vehicle Kilometres Travelled per Capita
VPADD:	Voluntary Pro-Active Deal-Driven

1 Introduction

This dissertation comprises six chapters. In this introductory chapter, Section 1.1 presents the research problem, which is first contextualised through a broad overview of urban planning theories, followed by consideration of their relevance in the context of pre-democratic South Africa, in which aspects of these theories had been employed as instruments through which to racially oppress; leaving a legacy of racially linked spatial inequality. Democratic era interventions are then discussed, in terms of their impact on this legacy, and what spatial challenges exist today; focusing on consequent restricted access to opportunities, and policy induced gentrification.

In response to the research problem, Section 1.2 introduces the objectives of this research; in essence, to establish whether there is a need for, and whether it is technically feasible to develop, a GIS (Geographical Information System) based inclusionary housing PSS (Planning Support System), that uses existing data and GIS software, to assess the financial viability of inclusionary housing projects, on the basis of local conditions.

In section 1.3, an outline of this dissertation is presented.

1.1 Research Motivation and Background

1.1.1 Urban Planning Theory

1.1.1.1 *The Transport-Land Use Interrelationship – Efficiency, Access to Opportunity and Bid-Rent Theory*

Throughout history, advances in transportation technology have been driven by a desire to reduce the cost of travel, in terms of both time and money, and to allow improved access to a wider range of opportunities (Moore et al, 2007; The Urban Institute [TUI], 2014; Cervero, 2013). It is argued that “a key reason cities exist, in an economic sense, is to economize on the transportation costs associated with conducting the activities essential and optional for daily life” (Moore et al, 2007:20). High population densities found in cities mean large-scale investment in infrastructure and services can be utilised more fully, and therefore more efficiently (South African Cities Network [SACN], 2016). It is the access to educational and income generating opportunities offered by cities that has resulted in consistent urbanisation trends globally, and which has helped “millions escape poverty” (SACN, 2016:24).

Urbanisation brings increased demand for a limited supply of urban land, which in turn impacts the market value of this land (Moore et al, 2007). Described as ‘bid-rent theory’, there exists a strong correlation between a land parcel’s market value and its relative accessibility (Moore et al, 2007). Accessibility is a measure of the ease and convenience with which opportunities for activities and services can be reached (Thompson et al, 2012). It is a function of transportation services and infrastructure (motorised and non-motorised), the cost of travel in terms of both time and money, as well as the opportunity characteristics of land parcels nearby (Thompson et al, 2012). Therefore, on the open market, central and easily accessible parcels typically fetch higher ‘bids’ than peripheral parcels with poor accessibility (Moore et al, 2007).

It is widely accepted that people’s willingness to travel is constrained by what is termed Marchetti’s constant; an aversion to exceeding a daily travel time budget of one hour (Newman & Kenworthy, 1996; Baumgartner, 1995; Moore et al, 2007). Consequently, people typically prefer residential locations where their daily commutes do not exceed half an hour per direction (Newman & Kenworthy, 1996). Tying in with Marchetti’s constant, the spatial forms of cities are inherently linked with the transport technologies available and adopted during their main periods of expansion

(Newman & Kenworthy, 1996); different technologies have different accessibility characteristics and opportunity costs.

Prior to motorised transport, cities were compact (rarely over 5km across), dense (100 to 200 people/ha), with mixed land use and high levels of connectivity, and thus highly walkable (Newman & Kenworthy, 1996). With the adoption of trams from the late 19th century, far longer distances could be covered within the travel time budget, and even farther with trains (Newman & Kenworthy, 1996); previously less accessible (and therefore cheaper) peripheral land parcels could now be reached conveniently. Cities which experienced substantial growth during this era are characterised by radial corridors of development along tram and train lines, converging on city centres with intense activity (Newman & Kenworthy, 1996). At between 20 and 30 km in width, and population densities typically between 50 and 100 people/ha, the scale was such that most destinations could still be reached within half an hour, but only through motorised transit (Newman & Kenworthy, 1996).

Cities which expanded predominantly in the early to mid-20th century, when automobiles became prevalent, are characterised by evenly spread and lower density development (Newman & Kenworthy, 1996); road networks allowed the unlocking of cheaper previously less accessible land between transit corridors. The limited access freeway, adopted in cities which grew substantially post-1950s, enabled high speed travel to cheaper land on the urban periphery (Newman & Kenworthy, 1996). Such cities are characterised by strict segregation of land uses through zoning laws, typically with an even distribution of low density residential suburbs that can extend over 50 km in every direction from the city core (Newman & Kenworthy, 1996). Population densities far below 20 people/ha are common (Newman & Kenworthy, 1996). “The significance of the automobile city is that it appeared to provide a means of overcoming the transport-land use connection. It offered freedom in space and time - to live anywhere and get quickly to all destinations regardless of location” (Newman & Kenworthy, 1996:5). However, decades of automobile-oriented development in many major cities resulted in unsustainable and deeply entrenched environmental, economic and social patterns (Cervero, 2013).

The widely held misconception that improved mobility through highway expansion could reduce congestion, was due to ignorance of the limitations inherent in transport modelling techniques, and the impact transport system changes have on land use (Beimborn et al, 1996); the consequences of which can be seen in most major cities where ‘predict and provide’ automobile oriented planning strategies have been applied (Newman & Kenworthy, 1996). In sprawling automobile-oriented environments, it is virtually impossible to sustain efficient, comprehensive and convenient public transit services (Cervero, 2013). Consequently, those who live in such cities with limited or no automobile access (due to affordability, disability or age), are severely transport disadvantaged (Newman & Kenworthy 1996), and a large percentage of those with automobiles access have commute times far in excess of half an hour per direction, due to heavy congestion and long distances associated with sprawl (Newman & Kenworthy 1996). In sprawling American cities, the VKT (vehicle kilometres travelled) per capita is significantly higher than in pre-21st century Asian cities (see Figure 1), with much higher population densities, and dominance of public transit and NMT (Non-Motorised Transport) (Newman & Kenworthy, 1996). In the 21st century however, the landscape in many Asian cities changed dramatically; with booming economies, and accelerated urbanisation, there has been a surge in automobile adoption; consequently, some cities have seen VKT (vehicle kilometres travelled per capita) increases of over 50% in less than two decades (Cervero, 2013). This acts as stark warning of the dangers of allowing automobile accommodation to dominate development strategies in environments with high levels of urbanisation typically only seen in the developing world.

	US cities	Australian cities	Toronto	European cities	Asian cities
Transport					
Car use (pass km/cap)	12 586	10 729	5 933	5 600	1 799
Public transport use (pass km/cap)	522	816	1 976	1 791	3 059
Total travel (pass km/cap)	13 108	11 545	7 909	7 391	4 858
% transit (of total travel)	4.4	7.2	25.0	24.8	64.1
Walking/biking (% journey to work)	5.3	5.4	5.5	21.3	25.1
Transport infrastructure					
Transit service (km/cap)	30	57	78	79	103
Road provision (m/cap)	6.6	8.8	2.7	2.1	1.0
Relative provision for transit (km service/km of road)	5 690	7 063	30 545	40 621	242 491
Parking spaces in CBD (per 1000 CBD workers)	380	401	198	211	67
Land use					
Urban density (metro area)					
Population	14	13	40	54	160
Jobs	7	5	20	31	71
Central area density					
Population	54	12	25	92	149
Jobs	500	314	757	361	692
Inner city density					
Population	45	22	57	91	464
Jobs	30	24	38	79	296
Outer area density					
Population	11	12	34	43	115
Jobs	5	4	14	17	43

Figure 1 - Transport and Land Use Patterns in 32 Global Cities, 1980 (Newman and Kenworthy, 1996:9)

By the late 20th century, in response to the environmentally, socially and economically unsustainable patterns that had developed in most US cities, the New Urbanist movement emerged (Cervero, 2013). Through mimicking neighbourhood designs of urban environments developed prior to automobiles (dense, compact, pedestrian friendly, and mixed in functional land use), New Urbanist development approaches aim to encourage lifestyles reliant on NMT (non-motorised transport) and public transit, rather than automobiles (Cervero, 2013). TOD (Transit Oriented Development) is one such approach, which promotes the orientation of each neighbourhood – in a network of neighbourhoods – around transit stops (Cervero, 2013); it is argued to be ‘retrofitable’, through strategic densification and encouragement of mixed land use on an 800m radius around existing transport nodes.

1.1.1.2 Transport-Housing Inter-relationship – Affordability and Access to Opportunities

In the 1960s, urban economists Muth and Alonso examined the relationship between transportation costs and choice of location of American households (TUI, 2014); it was apparent that low-income families favoured smaller dwelling units in more central locations, over larger suburban dwelling units (which were favoured by higher-income households). It was argued that proximity to employment opportunities and lower transport costs associated with public transit systems (typically only servicing more central areas) were key influences (TUI, 2014). According to TUI (2014), transportation has a significant impact on the financial stability of low-income families; studies conducted in the US have revealed that low-income households with automobile access have an increased likelihood of finding and retaining employment (TUI, 2014). In addition, the duration of unemployment is reduced for households with automobile access (TUI, 2014). While the correlation between public transit access and employment outcomes in public transit rich urban neighbourhoods is not as strong as with

automobile access, studies have shown that for households without automobile access, public transit access does have a positive impact on the probability of employment, and a reduction in time reliant on welfare (TUI, 2014).

1.1.2 Urban Planning in the Context of South African

Over twenty years into the democratic era, South African cities are plagued with economic and social challenges, which are severely aggravated by a spatial legacy of past racial segregation and automobile-oriented development strategies. To better understand the challenges, first historical context is presented, followed by review of democratic era interventions and planning strategies.

1.1.2.1 *Origins of Urban Racial Segregation in South Africa*

The origins of urban racial segregation in South Africa can be traced back to colonial era rule, where micro-segregation (racial segregated use of facilities), meso-segregation (racially exclusive neighbourhoods within multi-racial urban environments) and macro-segregation (racially exclusive territorial segregation) all operated (van den Berghe, 1966).

Lord Milner (High Commissioner of South Africa late 19th century/early 20th century) wanted “to increase English-speaking settlement in South Africa so as to outnumber Afrikaners” (Parnell, 1993:476), and intended doing so through the cultivation of an urban environment compatible with European tastes. At the turn of the 20th century, Milner appointed Charles Porter to the newly created post of Medical Officer of Health in Johannesburg (Parnell, 1993). Porter, influenced by international attitudes towards urban reform in terms of providing quality housing for the urban working class to prevent the spread of disease, implemented extensive anti-slum controls (Parnell, 1993). During this period, urban centres saw a large influx of unskilled white Afrikaans speaking tenant farmers, who had been out-bid off their land by an emerging capitalist agriculture class (Parnell, 1993). Without marketable urban skills, and since wages for unskilled white labourers were up to 8 times higher than for black labourers, few found employment on the open market (Parnell, 1993). Fears grew amongst the ruling class that disaffected white Afrikaners, would find common cause with their black working-class compatriots, with whom they cohabitated in urban slums, and that united non-racial working-class organisation would spread (Parnell, 1993). It was in this context that “the campaign for public health legislation was...rapidly transformed in an attempt to deal with particularly South Africa urban issues, foremost of which was the proliferation of the inadequate living quarters of the racially integrated working class in the industrial centres” (Parnell, 1993:478).

After the unification of South Africa in 1910, with a desire to extend his sphere of influence beyond Johannesburg, Porter resorted to populist rhetoric; stressing the supposed importance of “establishing separate locations for Africans, coloureds and Indians, as an integral part of general town-planning provision” (Parnell, 1993:478), claiming this to be “a most important matter from the public health point of view” (Parnell, 1993:478). By the end of the First World War, this attitude had become pervasive amongst the ruling class, intensifying the impact of racist attitudes on policy decisions and legislation (Parnell, 1993). At the September 1918 conference on the Public Health Bill, a decision was made to expel black citizens with tuberculosis and venereal disease to rural areas, rather than provide treatment as administered to white patients; setting a precedent for racially inspired forced removals (Parnell, 1993).

During the decades leading up to the Apartheid era, several pieces of legislation were put in place which gave local authorities the power to exclude and even forcibly remove specific race groups from racially integrated areas; most notably the 1923 Natives Act and the 1946 Asiatic Land Tenure Act (Mabin, 1992).

1.1.2.2 Apartheid Era Urban Racial Segregation, Forced Removals and the Threat to Mobility of Labour

Prior to the Apartheid era, “the inner-city offered working class communities...the tangible benefits of affordable housing, close proximity to places of work and schools, and public transport” (Garside, 1993:3); South African urban poor communities’ residential location preferences thus mirrored Muth and Alonso’s observations in the US (discussed in section 1.1.1.2). The primary aim of the Apartheid government was to destroy racial unity and maintain white supremacy; thus, systematic racial segregation intensified dramatically (van den Berghe, 1966). The 1950 Group Areas Act (Group Areas Act, No. 41 of 1950, 1950) passed by the Apartheid government retroactively reclassified almost all urban neighbourhoods, allowing only single race groups to continue to reside in them, whilst demarcating new undeveloped districts for black and coloured population groups (Mabin, 1992); this led to the forced removal of millions of black and coloured South Africans (who were no longer permitted in central urban areas) to the undeveloped urban fringe, with inadequate public transit penetration, and environments where efficient, comprehensive and convenient public transit was not sustainable (Berrisford, 2011). Given the financial circumstances of most within these newly formed communities, few could afford automobiles, and thus, ironically, though the Apartheid economy was reliant on an abundance of cheap black labour (Christie & Collins, 1982), forced removals to remote automobile-oriented neighbourhoods threatened the mobility of labour, and thus the very sustainability of the Apartheid model (McCarthy & Swilling, 1985). To ensure labour remained abundant, cheap and mobile, public transit services linking urban centres with these outlying locations had to be expanded (South African Council for Scientific and Industrial Research [CSIR], 2000). Aggravating the efficiency of the transport-land use link further was the passing of oppressive planning laws, which aimed to perpetuate the vulnerability of black communities, through the prohibition of commercial and industrial activities in ‘black’ areas (Berrisford, 2011); consequently, the urban poor had no choice but to travel far to places of work.

By the early 1980s, the Apartheid government could no longer sustain its forced relocations model (Levenson, 2014), and in 1986, influx control was abolished (Olivier, 1986). Black South Africans who had been relegated to underdeveloped rural Bantustans began returning to cities in great numbers in search of employment (Levenson, 2014); with no affordable housing opportunities, informal settlements on the urban periphery grew rapidly (Levenson, 2014).

1.1.2.3 Apartheid Legacy

One of the most conspicuous reminders of a long history of racial injustice is the spatial legacy left by Apartheid (Christopher, 2001). The latter 20th century saw significant population growth (see Figure 2); hence much urban expansion took place after the passing of the 1950 Group Areas Act (Group Areas Act, No. 41 of 1950, 1950), and during ‘the automobile era’ (as discussed in section 1.1.1.1). Apartheid era spatial planning drew heavily on automobile oriented American transport planning practices, which promoted closed neighbourhoods, functional road hierarchies and land use zoning segregation (Behrens, 2002a) – widely acknowledged a fundamental hindrance to sustainable transport-land use inter-relationships, as well as transport equity (Cervero, 2013; Kennedy et al, 2005; Newman & Kenworthy 1996; Behrens, 2002a). A legacy of sprawl (South African Cities Network [SACN], 2011), and inadequate public transit services thus remains (SACN, 2016). Segregation by “race group”, and hence economic class (Berrisford, 2011) means that those in greatest need continue to experience restricted access to opportunities, exacerbating and reinforcing inequality. The combination of low wages, long distances, tidal passenger flows, and high peak to base ratios (Scorcia & Munoz-Raskin, 2017) meant that heavy subsidisation was (McCarthy & Swilling, 1985), and to this day still is (SACN, 2016) required to sustain insufficient public transport services (but which are

essential, given that less than 30% of the national population have regular access to an automobile according to National Department of Transport [NDoT] (2014)).

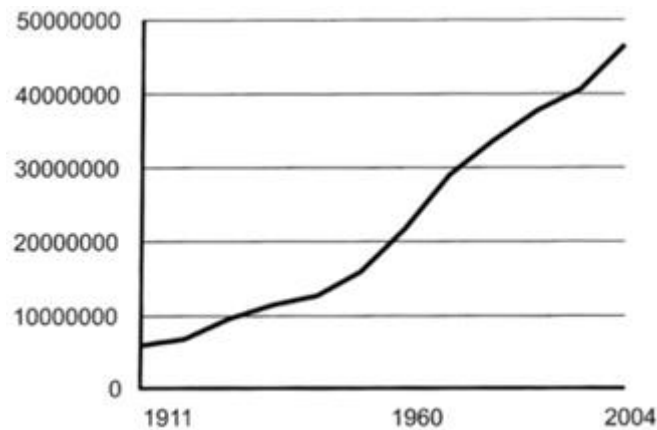


Figure 2 - Population Trends South Africa 1911-2004 (South African History Online [SAHO], 2011)

The inadequacy of the public transit services provided by the state is highlighted by the continued growth in the democratic era of the informal privately run unscheduled minibus taxi industry (SACN, 2016). First emerging during the 1980s (Majeke, 2003), minibus taxis have filled gaps where public transit services do not extend or are inconvenient/unreliable (South African Cities Network [SACN], 2011). Being unsubsidised, routes are profit rather than customer oriented; taxis only depart from ranks once full, which can take many hours during off-peak periods (Majeke, 2003); making them unpredictable and unreliable outside of peak periods, especially for travellers wishing to embark along the route rather than from ranks (which are many kilometres apart). In addition, the lack of subsidisation means that fares are higher than that of public transport services, and more sensitive to fuel price volatility; tight profit margins have contributed to a culture of reckless driving, overloading, and violent (often lethal) eruptions between rival operator gangs competing for passengers and routes (Gauthier & Weinstock, 2010:320; Majeke, 2003).

Today, “more than 60% of South Africans live in urban areas, and this figure is projected to increase to 71.3% and 80% by 2030 and 2050 respectively” (Department of Cooperative Governance & Traditional Affairs [CoGTA], 2016:4). While there is a drive to improve public transport penetration and quality of service (SACN, 2011) to peripheral locations where a large percentage of the urban poor reside (SACN, 2011), the question of sustainability – in terms of the impact that such improved transport systems would have on land use and thereby reinforce unsustainable and inequitable patterns – cannot be ignored.

1.1.2.4 Democratic Era – Housing, Urban Planning and Gentrification

A key component of the Reconstruction and Development Program (RDP) initiated in 1994 was the implementation of a formal housing delivery program for those living in informal settlements (Levenson, 2014). By 2014, over three million RDP houses had been constructed (Levenson, 2014). Whilst the scale of delivery is certainly impressive, the substitution of informal structures with those that are permanent, mostly on the urban periphery, has reinforced spatial inequality (Levenson, 2014), as well as unsustainable transport/land use inter-relationships (SACN, 2011).

Automobile-oriented development strategies of the Apartheid era had influenced accelerated decentralisation and institutional capital disinvestment from inner-city areas, leading to inner-city decline (Visser & Kotze, 2008). The transition to democracy coincided with shifting attitudes towards automobile dominated planning strategies; New Urbanist philosophy had gained considerable traction in the developed world (Behrens, 2002a). Cognisant of the transport disadvantage most South Africans

continued to endure, The White Paper on National Transport Policy (National Department of Transport [NDoT], 1996) put in place foundations which sought to challenge automobile dominance, by encouraging New Urbanist interventions, including densification, infilling, mixed land use, containment of sprawl and reversal of decentralisation. Although progressive in intent, an outcome was a policy environment conducive to implementation of inner-city and surrounding precinct regeneration programmes guided by neo-liberal attitudes, which foresaw the development of South African urban centres into globally competitive arenas, capable of attracting foreign direct investment, as a mechanism through which economic growth could be accelerated (Visser & Kotze, 2008). This approach was inherently conflicted, in that economic growth came at the expense of much needed socioeconomic redistribution; rather than improving access of those previously excluded from the economy, this exclusion intensified through policy induced gentrification (Visser & Kotze, 2008). In addition, with a steadily growing middle class, automobile ownership has risen; severe congestion during peak travel periods is now seen across all major urban centres, with travel times for many in excess of an hour per direction (NDoT, 2014). Consistent with Marchetti's constant (see section 1.1.1.1), convenience of location adds to the appeal of these gentrifying central neighbourhoods; with increased demand, property prices have increased dramatically (Visser & Kotze, 2008).

Regeneration of central Cape Town and its surrounding precincts was catalysed through CIDs (City Improvement Districts); privately funded organisations (through additional levies on property owners), providing supplementary services – primarily private security and CCTV networks – managed through the non-profit agency, Cape Town Partnership, established in 1999 by City of Cape Town municipality, to catalyse the regeneration of central Cape Town (Visser & Kotze, 2008). National Treasury introduced the UDZ (Urban Development Zone) incentive in 2003 (Visser & Kotze, 2008); offering private sector investors substantial tax rebates on new construction, re-development and residential conversion projects within demarcated (central) zones of South African cities. By 2008, private sector funded construction in central Cape Town exceeded R15 billion (Visser & Kotze, 2008). The seven-year period following the establishment of the Cape Town Partnership was characterised by accelerated gentrification; residential property prices tripled, and displacement of low-income groups increased (Visser & Kotze, 2008).

Similar patterns emerged in Johannesburg; after UDZ status was applied to the dilapidated east side of Johannesburg's CBD (Maboneng), substantial private sector investment in the form of re-developments and residential conversions targeted at "young 'creatives', professionals and entrepreneurs" (Hogarth, 2015:60) took place. Consequently, poor residents who had resided in neglected buildings, were displaced (Hogarth, 2015).

While the UDZ programme appears to have succeeded in encouraging significant private sector investment in central urban areas (Engineering News, 2014; Global Africa Network, 2018), in recognition of the negative impact to low-income communities, incentives encouraging inclusion of low-income units in residential developments were introduced to the UDZ programme upon National Treasury's extension of the programme till 2020 (South African Revenue Service [SARS], 2016).

1.2 Research Objective

The research objectives are to establish whether there is a need for, and whether it is technically feasible to develop, a GIS (Geographic Information System) based inclusionary housing planning support system (PSS), that is capable of assisting public authorities estimate the scale of concessions required to ensure inclusionary housing projects can be profitable, and thus attractive to private sector investors, in the context of urban South Africa. Unique to this context are 'income cliffs' amongst the steepest in the world, resulting in a highly challenging environment in which to achieve

financially viable inclusionary housing developments. Should the desire exist to introduce inclusionary housing requirements by governing authorities in South Africa, it is possible that a successful PSS could aid decision making by enabling optimisation of the concessions/inclusionary housing requirement balance. Ideally this could help prevent gentrification induced displacement of low-income communities from central urban areas, and new affordable housing opportunities for low-income communities currently living on the urban periphery, could be generated.

The decision by private sector property developers to pursue projects, and local authorities to grant concessions, are influenced by constraining factors unique to each land parcel considered; for example, the value of a land parcel, and rental income potential, are correlated with the suburb in which it is situated. It is hypothesised that a GIS based PSS, capable of efficiently analysing factors on multiple land parcels, could aid decision-making, by allowing comparison of the impact that use rights concessions, in exchange for meeting inclusionary housing requirements, may have on the financial viability of potential projects on different sites.

The PSS must be flexible enough to be able to accommodate widely differing conditions across precincts, in a fair, consistent, and transparent manner. Due to continually fluctuating market conditions, the system needs to be dynamic, and have the capability of being updated on an ongoing basis. It should have the capacity to function as an instrument to both guide and implement inclusionary housing policy.

Ideally the system should not require the collection of primary data; as far as possible it should work within the constraints of existing GIS databases maintained by governing authorities, and market data collected by private sector property analysis consultancies.

While the development of a user interface falls outside the scope of this study, it is important that the system be developed with end users in mind (which include policy development officials, case officers, and private sector developers/investors). A balance must be struck in which the system is sufficiently rigorous to accommodate a wide range of scenarios, but where the number of inputs required to operate the system is minimised (to ensure simplicity of use and sufficient transparency).

Ultimately, a successful system would be endorsed by public authorities, and must help mitigate reluctance of private sector property developers to invest in precincts in which inclusionary housing requirements are introduced, by ensuring the financial viability of projects are reliably estimated on the basis of local conditions.

1.3 Outline of Dissertation

Refer to Figure 3 for a visual representation of the research plan.

Chapter 2 presents a literature review, in which relevant South African policy documents, frameworks, as well as legislation are studied, to establish their compatibility with inclusionary housing as an intervention to the research problem, thereby establishing whether a GIS based inclusionary housing planning support system could be of value, and what factors might need to be considered by such a tool. In addition, literature is reviewed pertaining to GIS based affordable housing tools, to establish what techniques have been developed elsewhere, and whether any of these tools take financial viability of inclusionary housing projects into account.

Chapter 3 presents the research method. Firstly, key findings of reviewed literature are considered, followed by the corresponding research intervention proposed. In addition, the process through which the PSS was developed (including: stakeholder identification and consultation; identification of a study area and sources of data; developing of the mathematical model; and scripting of the system in

Python) is presented. The chapter concludes with the identification of five case study sites on which the final PSS was run, with input from various stakeholder groups, so that the system could be assessed in the context of sites on which stakeholders would consider pursuing projects.

Chapter 4 presents the findings of this research, firstly in terms of stakeholders' perspectives in relation to inclusionary housing and the proposed research intervention; then in terms of availability of data and ability to utilise this data in the manner envisaged by the proposed research intervention; and finally, in terms of case study outputs.

In chapter 5, the outcomes of discussions held with various stakeholder groups (upon PSS development finalisation) are presented. This is followed by discussion of the case study findings, in terms of the implied impact that local conditions and inclusionary housing requirements may have on financial viability of each project. In addition, system shortcomings identified through evaluation of case study findings, with stakeholder input, is presented.

Finally, chapter 6 presents conclusions drawn from this research, in which firstly the research objectives are recapped, followed by identification of which objectives were and were not met. Additionally, shortcomings identified with this research, and recommendations on how to take this research forward, are presented.

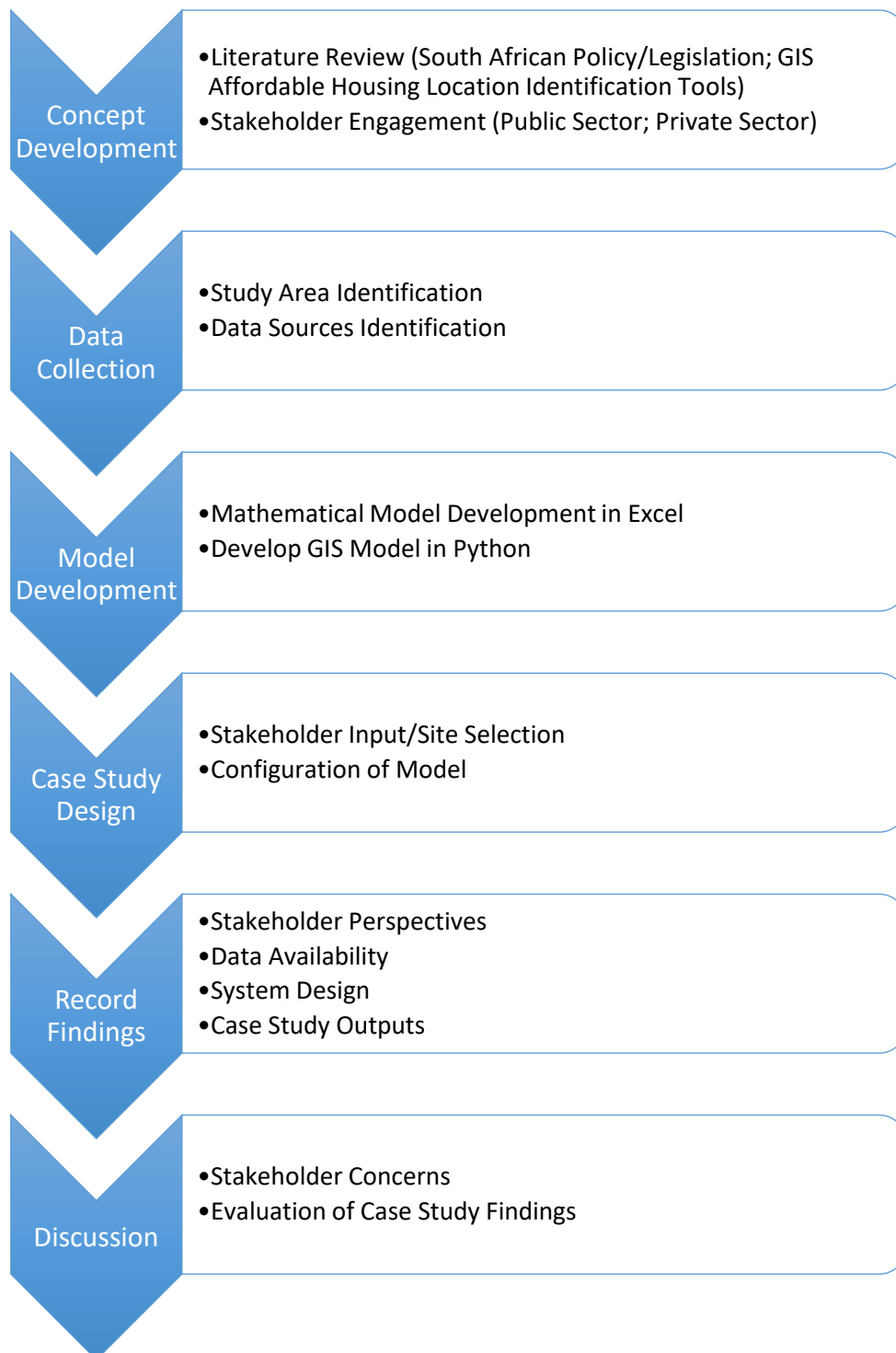


Figure 3 - Research Plan

2 Literature Review

This chapter is divided into two sections. Section 2.1 reviews a range of South African policy documents, frameworks and legislation, to establish whether inclusionary housing – as an intervention to the research problem – is a compatible approach, and worth pursuing. Section 2.2 reviews literature pertaining to studies in which GIS tools have been developed that facilitate the identification of sites suitable for affordable housing, in order to gain a greater understanding of the capabilities of GIS based tools in this field, and to determine whether financial viability calculations are performed by any of these tools; indicating whether the proposed PSS is technically feasible.

2.1 Policies, Frameworks and Legislation

In this section, key South African policy documents, frameworks and legislation are reviewed, specifically with regard to their reference to affordable housing, and where applicable, inclusionary housing.

2.1.1 Constitution of South Africa (1996)

According to the Constitution, “everyone has the right to have access to adequate housing” (Constitution of the Republic of South Africa, Act No.108 of 1996, 1996). It should be noted that this right is not qualified with a spatial stipulation; while the RDP housing development approach (single unit dwellings on peripheral land (NDoT, 1996)) to a large extent hinders recipients’ ability to access services, perhaps an explicit spatial qualification could have prevented this unsustainable approach.

2.1.2 White Paper on National Transport Policy (1996)

The White Paper on National Transport Policy (NDoT, 1996) emphasised the importance of understanding the bi-directional inter-relationship between land use and transport systems, and the spatial and structural challenges facing urban South Africa, as a consequence of Apartheid policy, administrative, planning and regulatory structures. It is recognised that this “...has led to low density development, spatially dislocated settlements and urban sprawl, resulting in inordinately long commuting distances and times, low occupancy levels, high transport costs and low cost recovery” (NDoT, 1996:21).

Already at this early stage, NDoT (1996) recognised that the RDP housing approach (initiated just two years prior) was reinforcing unsustainable transport-land use interrelationships.

Policy actions promoted by the White Paper have a strong New Urbanist influence: “land use frameworks, guidelines and policies to channel development, particularly employment activities, into public transport corridors and nodes. Development priority will be given to infilling, densification, mixed land use....; containment of urban sprawl and suburbanisation beyond the urban limits; decentralisation which disperses employment activities must be discouraged...” (NDoT, 1996:21).

The restrictive consequences of inadequate transport systems were highlighted, in terms of limiting access to basic needs such as work, health care, schools and shops (NDoT, 1996). In recognition of unsustainable transport-land use interrelationships, “more efficient urban land use structures, correcting spatial imbalances and reducing travel distances and times for commuting to a limit of about 40 km or one hour in each direction” (NDoT, 1996:20) was encouraged. It is difficult to ignore just how revealing these (arguably pragmatic, but nonetheless problematic) figures are (double what would be considered reasonable according to Marchetti’s constant – as discussed in section 1.1.1.1) in terms of highlighting the degree to which South African cities sprawled during the Apartheid era. Consistent with the New Urbanist approach, prioritisation of public transport over private transport was encouraged (NDoT, 1996).

While the White Paper (NDoT, 1996) makes no explicit mention of inclusionary housing, the issues raised with the RDP housing delivery approach, indicate that attitudes within NDoT at this time were certainly compatible with the inclusionary housing model.

2.1.3 Moving South Africa 1999

Moving South Africa (MSA) was a 20-year strategic framework published by NDoT (National Department of Transport), which elaborated on objectives/challenges established in the 1996 White Paper on National Transport Policy, aiming to contextualise/guide discussions to be initiated by NDoT with various stakeholders (National Department of Transport [NDoT], 1999). Key foci were transport equity and sustainability (in terms of access to opportunity/user experience); identifying unsustainable land-use/spatial patterns, and capacity inadequacies in PT services.

MSA, cognisant of the transport-land use inter-relationship (given its New Urbanist perspective), argued that “suboptimal spatial planning is probably the biggest driver of public transport costs and the most difficult to turn around” (NDoT, 1999:27). Furthermore, peripheral low-cost housing developments were understood to be reinforcing this undesirable status quo, threatening the viability of convenient and comprehensive PT systems further (NDoT, 1999), and “clashing with the goal of improving access to opportunities for all” (NDoT, 1999:27).

MSA recognised that “the move toward corridor densification and improving the service standards...will require increased short term funding to offset higher land and housing costs and improvement in the quality of vehicles, stations and information systems” (NDoT, 1999:31), however, “this short-term increase in funds should be viewed as an investment in that it creates the conditions for long term financial sustainability through lower system cost and increased revenue generation” (NDoT, 1999:31). Establishing sources of funding for the large outlay (perhaps somewhat dubiously argued to only be required during an unqualified short term) would of course be a challenge, not to mention the permanent nature of existing sprawled development and uncertainty in terms of how to protect the rights of residents already ‘locked in’ to peripheral location, many of whom MSA acknowledge are ‘captive’ PT and paratransit users (NDoT, 1999).

In conclusion, it is evident that while there is no explicit mention of inclusionary housing as an approach to challenging the status quo, it remained compatible with NDoT’s development vision.

2.1.4 CSIR Guidelines for Human Settlement Planning and Design 2000

In 2000, CSIR (Council for Scientific and Industrial Research) published its ‘Red Book’, or Guidelines for Human Settlement Planning and Design, developed through a collaborative process between government departments, guided by NDoH (National Department of Housing), and managed and compiled by CSIR (CSIR, 2000:1.1). The intention of this document was to ensure establishment of an “economically, physically, environmentally and socially integrated and sustainable built environment” (CSIR, 2000:i), by providing “a guiding vision for South African settlement formation” (CSIR, 2000:i), that encourages participation and collaboration between local government, the private sector, and communities (CSIR, 2000).

Symbolising an alignment of visions between NDoH and NDoT, the Red Book is heavily influenced by ‘New Urbanist’ philosophy, advocating for substantial investment and prioritisation of PT over private vehicles (CSIR, 2000), and highlighting the interdependent link between PT sustainability and compact, mixed-use spatial form (CSIR, 2000). It argued that high density residential development in close proximity to high priority PT links is core to maximise PT utility and thus sustainability, to the extent that further development in existing nodes not in close proximity to high order PT corridors, should cease (CSIR, 2000), and PT stops should be within 400 m of every residence (CSIR, 2000).

In the context of both private sector, but more specifically, government housing developments (in which meeting quantity targets is prioritised), consistent with bid rent theory (Moore et al, 2007), the Red Book identifies higher cost of land closer to the CBD a key challenge in achieving densification along existing PT corridors and reversing decentralisation trends (CSIR, 2000). However, the Red Book argues that reduced transport infrastructure, operating and user costs, as well as more efficient use of existing community infrastructure (rather than continued expansion of under-utilised services), generate savings over time which compensate for the higher cost of land (CSIR, 2000). No explicit mention of inclusionary housing as a potential cross-subsidisation mechanism was made, however it is clearly compatible with the endorsed development approach.

2.1.5 “Breaking New Ground” A Comprehensive Plan for the Development of Sustainable Human Settlements 2004

Breaking New Ground (BNG) was a document prepared by NDoH focused on establishing mechanisms to ensure more sustainable and equitable human settlement development approaches (in terms of transport-land use inter-relationship, primarily with regard to low-income housing), through the implementation of a 5-year plan (National Department of Housing [NDoH], 2004). The document outlined and aimed to address key criticisms of the department’s prior approaches, whilst indicating the scale of the challenge faced

According to BNG, “over a quarter of the households in the country’s nine largest cities...continued to live in informal dwellings in 2001” (NDoH, 2004:3). Rapid urbanisation and insufficient job creation (NDoH, 2004) contributed to a growing government assisted housing backlog (NDoH, 2004). “The repeal of the Group Areas Act created an increased demand in historically well serviced and located neighbourhoods – fuelling demand and increasing prices and sale and property investment” (NDoH, 2004:4). Although recognising the burden Apartheid spatial settlement patterns put on transport-land use systems, and the consequent disadvantage suffered by the urban poor (NDoH, 2004), the “lack of affordable well located land for low cost housing resulted in the housing programme largely extending existing areas [informal settlements], often on the urban periphery” (NDoH, 2004:4); further reinforcing these unsustainable patterns and inherent inequality. Consequently, one of the key objectives of the 5-year plan was to utilise housing as “an instrument for the development of sustainable human settlements, in support of spatial restructuring” (NDoH, 2004:7).

Despite a growing government assisted housing backlog, BNG identified a decline in housing delivery and under-expenditure of provincial housing budgets; partially attributed to “the withdrawal of large construction groups from the state-assisted housing sector due to low profit margins” (NDoH, 2004:5). This highlights the importance of ensuring private sector partners can draw sufficient profit through their involvement, especially as “continuation and deepening of the partnership between government and the private sector vis-à-vis the development of sustainable human settlements” (NDoH, 2004:7) was sought by NDoH. NDoH “in conjunction with Treasury and SARS, will investigate the development of fiscal incentives to promote the densification of targeted human settlements and whilst introducing disincentives to sprawl” (NDoH, 2004:13). “Social housing developments should be dovetailed with other initiatives such municipal redevelopment projects and the urban development zone tax incentive offered by SARS” (NDoH, 2004:14).

While BNG aimed to ensure that “property can be accessed by all as an asset for wealth creation and empowerment” (NDoH, 2004:7), it is acknowledged that few subsidy housing recipients have been able to unlock this potential, and rather experience decreased flexibility/mobility as they become tied to immovable assets often on the urban periphery (NDoH, 2004). Therefore “the new human settlements plan moves away from the current commoditised focus of housing delivery towards more

responsive mechanisms which addresses the multidimensional needs of sustainable human settlements” (NDoH, 2004:8). One such mechanism proposed is medium density social housing, which may be developed on an inclusionary housing model, with “multi-level flat or apartments options for higher income groups (incorporating beneficiary mixes to support the principle of integration and cross-subsidization)” (NDoH, 2004:18). BNG noted “the inability of recipients of subsidy-housing to pay for municipal services and taxes has meant that such housing projects have been viewed as liabilities to municipalities” (NDoH, 2004:4). A mechanism proposed by BNG (which could reduce this burden), was to introduce a development permit scheme, in which all private residential developments (in central urban areas presumably) would be obliged to “set aside units within residential developments for lower-income groups” (NDoH, 2004:12), resulting in a municipal rates cross-subsidisation opportunity.

BNG recognised that urban renewal, while being a key component in mitigating sprawl, tends to focus on commercial and high-income residential property redevelopment, which has resulted in poorer inhabitants of previously neglected areas being excluded (NDoH, 2004). “Many municipalities are striving to avoid this by promoting, amongst others, affordable inner-city housing” (NDoH, 2004:14). To ensure future state built low-income housing is developed more centrally, “public land and land held by parastatal organisations, where deemed suitable for housing purposes, is to be transferred to municipalities at no cost” (NDoH, 2004:13). In addition, to address a lack of sufficient well-located government owned land, “a strategy will be developed in conjunction with the Department of Land Affairs to finance and guide the acquisition of private land for housing purposes” (NDoH, 2004:13).

BNG therefore represents the first indication from NDoH that inclusionary housing could play a role in achieving spatial transformation desired.

2.1.6 Rental Housing Act of 1999 and Rental Housing Amendment Act of 2014

In the context of meeting a “latent demand for affordable rental housing among persons historically disadvantaged by unfair discrimination and poor persons” (Rental Housing Act, No. 50 of 1999, 1999:chap2), the Rental Housing Act of 1999 requires that incentives/mechanisms be introduced which encourage investment in urban areas in need of revitalisation, as well as to “correct distorted patterns of residential settlement [Apartheid spatial imbalance] by initiating, promoting and facilitating new development in or the redevelopment of affected areas”. To stimulate supply of low-income rental housing, the Act states that the Minister of Housing may introduce a national rental subsidy housing programme to which Parliament may appropriate funding annually (Rental Housing Act, No. 50 of 1999, 1999). In addition, the Rental Housing Amendment Act of 2014 states that the Minister of Housing must report to Parliament annually to establish whether these objectives are being met (Rental Housing Act, No. 35 of 2014, 2014).

In an environment in which there is no IHP, legislation does not explicitly handle inclusionary housing. However, challenging spatial inequality is a legislated requirement, and thus in theory remains congruous.

2.1.7 Framework for an Inclusionary Housing Policy in SA (Department of Housing, 2007)

In the context of Gauteng and Western Cape provinces developing draft IHPs (Inclusionary Housing Policies), NDoH published its Framework for an Inclusionary Housing Policy in South Africa (National Department of Housing [NDoH], 2007). Primarily, NDoH wanted to mitigate risks associated with a fragmented approach/uneven implementation of IHPs across the country, by providing a framework on which to develop a national IHP, as well as inform national legislation (NDoH, 2007). The framework defines inclusionary housing as “the harnessing of private initiative in its pursuit of housing delivery to middle/higher income households to also provide (include) affordable housing opportunities in

order to achieve a better socioeconomic balance in residential developments and also contribute to the supply of affordable housing” (NDoH, 2007:9).

Several sub-sections of this framework are explored:

2.1.7.1 International Experience

Examples of IHPs were found in many countries, but were concentrated “largely in the developed world and the rapidly developing economies of South and East Asia” (NDoH, 2007:4) where affordable housing delivery could be leveraged off typically “vigorous private sector property development industry” (NDoH, 2007:4) catering to middle and upper income population groups. For rapidly developing economies, delivering housing at scale was the primary motive, while more affluent nations aimed to achieve greater socio-economic/racial integration (NDoH, 2007). Some countries IHPs were linked with national legislation, whilst others were driven by local policies (NDoH, 2007). Most IHPs specified a minimum percentage of units/project value to be affordable (NDoH, 2007).

NDoH (2007) argues against a ‘one size fits all’ approach to inclusionary housing policy; indicating that flexibility is required to accommodate varying circumstances in different locations (NDoH, 2007). Therefore NDoH (2007) recommends a decentralised approach in which parameters are prescribed through a national IHP. It should be noted that a GIS based inclusionary housing PSS could be advantageous in terms of achieving this flexibility, by allowing consideration of nationally defined parameters at a localised scale and therefore relevant to local stakeholders.

2.1.7.2 Key Contextual Considerations in South Africa

NDoH (2007) compares the 150 000 to 200 000 RDP units historically delivered per annum with the rate of delivery of housing through private developments, which historically has peaked at around 60 000 units per annum (NDoH, 2007). Although NDoH (2007) argues that only a fraction of the housing backlog can be addressed through an IHP, it would be “an important contribution nonetheless”; especially when considering the spatial advantage over historically peripherally located government housing. What is clear however is that inclusionary housing is not a silver bullet solution capable of solving South Africa’s housing crisis alone.

NDoH (2007) highlights that with levels of income inequality amongst the highest in the world, ‘income cliffs’ (income difference between high and low earners) are far steeper in South Africa; it would therefore be more challenging to “achieve inclusionary outcomes and retain project viability in South Africa than elsewhere” (NDoH, 2007:8). A GIS based inclusionary housing PSS could allow for a standardised assessment of land parcels, and allow for adjustment of parameter variables until a project becomes both financially viable and sufficiently beneficial in terms of affordable housing delivery.

2.1.7.3 Affordability Definitions, Qualification Criteria and Objectives

According to NDoH (2007), affordable housing for ownership is defined as “the range between the current cost of a fully subsidized RDP house and the top of the “affordable housing range” as defined in the Financial Sector Charter + 40%”. Affordable housing for rental is defined as “the range between the rent that someone earning R1500 per month can pay and the rent that someone earning R7500 per month +20% can pay” (NDoH, 2007:10), but with values “revised by CPIX each year” (NDoH, 2007) to account for inflation.

In terms of qualification criteria for beneficiaries, NDoH (2007) proposed using household income along with existing government housing assistance criteria.

NDoH’s (2007) inclusionary housing objectives are listed as follows:

- To contribute towards achieving a better balance of race and class in new residential developments
- To provide accommodation opportunities for low-income and lower middle-income households in areas from which they might otherwise be excluded because of the dynamics of the land market
- To boost the supply of affordable housing (both for purchase and rental)
- To mobilize private sector delivery capacity to provide affordable housing
- To leverage new housing opportunities off existing stock at the same as contributing to the densification of South African cities
- To make better use of existing sustainable human settlements infrastructure

2.1.7.4 Key Points of Departure

Given the range of circumstances unique to South Africa, NDoH (2007) lists several key points of departure, which include the following:

- “In principle there should be no mandatory inclusionary requirement unless this is supported by reasonably proportional incentives. This is important to establish the ‘win-win’ outcome that government wants”
- “Circumstances in residential development projects are highly varied. Allowance for flexibility is as a consequence essential”
- “The best place for judgments to be applied about the extent of the incentive to be provided and the proportional inclusionary requirement is at the local level”
- “Whilst flexibility and local nuance is highly desirable, all inclusionary housing activity should take place in terms of the principles outlined here and in terms of the general parameters specified in subsequent sections. Whilst the detail of specific inclusionary arrangement[s] are likely to vary from circumstance to circumstance, they should all be derived via a common approach and process. This is to avoid the kind of fragmentation and confusion associated with different authorities taking different approaches”
- If existing bulk infrastructure is unable to accommodate higher densities, then inclusionary requirements should be less demanding

2.1.7.5 The Essence of the Policy Proposal and Inclusionary Housing Prescription

NDoH (2007) propose two primary inclusionary housing components, namely VPADD (Voluntary Pro-Active Deal-Driven) and TPC (Town Planning Compliant).

With VPADD, “...local authorities identify projects that they wish to actively pursue with private sector partners. Typically, local government will bring local government-owned land to the process as well as guarantees of quick development application processing times. In return they will generally require the provision of a substantial proportion of the units as affordable stock (this will however vary depending on the extent of the incentives provided and what a mixed income project will tolerate in externality terms before it becomes unviable). Private sector partners will also be encouraged to be pro-active and to approach local authorities with specific project-partnerships in mind” (NDoH, 2007:14). In theory, through a GIS based inclusionary housing PSS, municipalities could establish scales of incentive to be offered on selected sites.

Conversely, TPC would not operate on a voluntary basis (NDoH, 2007); “...the principle of TPC is that development permission, rezoning or subdivision approval is made contingent on meeting specified inclusionary requirements in return for being awarded certain development rights” (NDoH, 2007:15). These concessionary rights could include density bonuses, additional use rights and even public investment in bulk infrastructure (NDoH, 2007). In theory, through a GIS based inclusionary housing

PSS, private sector investors could identify sites on which they wish to pursue TPC developments, and negotiate the terms with the municipality.

Although some countries prescribe inclusionary housing requirements as a minimum percentage of the market value of the sum of open market units (NDoH, 2007), given the steep income cliffs and therefore steep cliffs in affordability, such an approach in South Africa would jeopardise project viability (NDoH, 2007). Therefore, NDoH proposes prescription though a minimum percentage of housing units (NDoH, 2007).

2.1.7.6 The Essence of the Policy Proposal and Inclusionary Housing Prescription

NDoH list six authority contributed incentives to achieve the desired public/private sector 'win-win' partnership (NDoH, 2007):

- Tax Benefits for private sector partners
- Government owned/acquired land
- Fast-tracking of development approval process
- Additional development and use rights
- Bulk and transport link infrastructure
- Access to government housing subsidy fund

Given that core objectives of inclusionary housing policy include encouragement of sustainable and compact urban forms (NDoH, 2007), local authorities would need to encourage inclusionary housing in strategically identified zones of a city. As a result, the abovementioned incentives will vary spatially; a GIS based PSS could be an effective medium through which these spatially varying incentives can be considered.

2.1.7.7 Project Type and Design

"The key principle to be observed is that the strict separation in space of affordable units from market units should as far as possible be avoided Ideally the affordable units should be integrated into the projects and blend in with the surroundings This implies that as far as possible architectural styles should be similar" (NDoH, 2007:27).

2.1.7.8 Legislative Requirements

"New legislation will be created to operationalize the National Inclusionary Housing Policy" (NDoH, 2007:27). It should be noted that at the time of this study, no such legislation had yet been drafted.

2.1.8 Spatial Planning and Land Use Management Act, No. 16 of 2013

Key objectives of SPLUMA (Spatial Planning and Land Use Management Act, No. 16 of 2013, 2013) include the provision of "a uniform, effective and comprehensive system of spatial planning and land use management for the Republic" (ibid); to "provide for the sustainable and efficient use of land" (ibid); and to "redress the imbalances of the past and to ensure that there is equity in the application of spatial development planning and land use management systems" (ibid).

Core development principals promoted by SPLUMA include spatial justice, spatial sustainability and efficiency (Spatial Planning and Land Use Management Act, No. 16 of 2013, 2013). To achieve spatial justice, planning mechanisms must "incorporate provisions that enable redress in access to land by disadvantaged communities" (ibid), even if "the value of land or property is affected" (ibid). Spatial sustainability is promoted by ensuring that land development only takes place in "locations that are sustainable and limit urban sprawl" (ibid). Efficiency is promoted through encouragement of land development which "optimises use of existing resources and infrastructure" (ibid). In addition, SPLUMA (ibid) requires that land use management norm and standards be prescribed by government

which “promote social inclusion, spatial equity, desirable settlement patterns...urban regeneration and sustainable development” (ibid).

In order to ensure adherence to these development principals/norms and standards, SPLUMA requires preparation of spatial development frameworks by national, provincial and municipal spheres of government (Spatial Planning and Land Use Management Act, No. 16 of 2013, 2013). Through these development frameworks, mechanisms must be put in place which “provide clear and accessible information to the public and private sector and provide direction for investment purposes” (ibid), and “indicate priority areas for investment in land development” (ibid). In addition, municipalities are required to “identify the designated areas where a national or provincial inclusionary housing policy may be applicable” (ibid).

SPLUMA requires that municipalities develop and adopt legally enforceable land use schemes which specify categories of land use zoning and regulations for the entire municipality, and which “include provisions to promote the inclusion of affordable housing in residential land development” (Spatial Planning and Land Use Management Act, No. 16 of 2013, 2013:chap5). The land use schemes must include “a map indicating the zoning of the municipal area into land use zones” (ibid). “A municipality may amend its land use scheme by rezoning any land considered necessary by the municipality to achieve the development goals and objectives of the municipal spatial development framework” (ibid), although “a public participation process must be undertaken to ensure that all affected parties have the opportunity to make representations on, object to and appeal the decision” (ibid). It is noted that “Provincial legislation regulating land development, land use management, township establishment, spatial planning, subdivision of land, consolidation of land, the removal of restrictions and other matters related to provincial planning and municipal planning may...provide measures related to the approval of a development application which requires the use of land for identified inclusionary residential and economic purposes, and which is subject to any national policy” (Spatial Planning and Land Use Management Act, No. 16 of 2013, 2013:chap7). Therefore, municipalities’ inclusionary housing planning decisions should be guided by provincial policy, which itself should be guided by national policy (and is therefore consistent with the inclusionary housing policy framework reviewed in section 2.1.7).

2.1.9 Social Housing Act 2008

The Social Housing Act (Social Housing Act, No. 16 of 2008, 2008) defines social housing as “a rental or co-operative housing option for low to medium income households at a level of scale and built form which requires institutionalised management and which is provided by social housing institutions or other delivery agents in approved projects in designated restructuring zones with the benefit of public funding”. Inclusionary housing as a form of social housing does not align fully with this definition, nevertheless, there are overlapping core principles:

“In giving priority to the needs of low and medium income households in respect of social housing development, the national, provincial and local spheres of government and social housing institutions must...support the economic development of low to medium income communities by providing housing close to jobs, markets and transport; ensure the sustainable and viable growth of affordable social housing as an objective of housing policy; promote training opportunities for stakeholders and interested parties who wish to enter the social housing market; promote social, physical and economic integration of housing development into existing urban and inner-city areas through the creation of quality living environments; promote medium to higher density in respect of social housing development to ensure the economical utilisation of land and services; promote incentives to social housing institutions and other delivery agents to enter the social housing market” (Social Housing Act

of 2008, No. 16 of 2008, 2008:chap1). It is clear that integration of low-income communities in central high density urban neighbourhoods with good transport links, that enables improved access to opportunities, is a key objective. The encouragement of efforts to create an enabling environment through training and incentives that attract private sector investors is congruent with NDoH's (2007) inclusionary housing strategy.

2.1.10 Concluding Remarks

Through review of legislation and policies outlined above, it is apparent that attempts have been made to develop inclusionary housing policies at both national and regional levels of government, but none have succeeded to progress beyond draft status. Consideration of spatially operating factors in the development of such policies has evidently proven a key challenge. It is therefore concluded that there is a need for spatially sensitive techniques to be developed, which can help evaluate the impact that inclusionary housing requirements may have on project financial viability, across urban environments in which market conditions vary widely. Section 2.2 presents various GIS based tools employing techniques, not intentionally developed for inclusionary housing applications, but which exhibit characteristics relevant in this context.

2.2 GIS in the Context of Housing

In this section, literature pertaining to studies in which GIS tools have been developed that facilitate the identification of sites suitable for affordable housing, is reviewed. The intention of this component of the literature review is to establish what techniques have been developed, thereby indicating whether the proposed inclusionary housing PSS is technically feasible. First a paper by Biermann & Van Ryneveld (2007) is presented, covering the development and application of a GIS PSS in South Africa; intended to aid public authorities select locations suitable for affordable housing delivery. This is followed by several papers produced by The Shimberg Center for Housing Studies; a research institute linked with the University of Florida, and which developed a GIS based HSM (Housing Suitability Model): a suite of tools to identify suitable locations for affordable housing. This is followed by the review of a study by Fard (2013), in which a GIS based TOD index tool was developed. Finally, a paper by Radut & Chitu (2009), which presents a broad discussion on the technical capabilities of GIS tools, is reviewed, specifically for content pertaining to housing developments.

2.2.1 Bierman & Van Ryneveld, 2007

The Biermann & Van Ryneveld (2007) paper provides insight into the evolution of a GIS based PSS (that had been developed by CSIR over the course of several years), which intended to aid policy decisions in terms of testing alternative models of affordable housing delivery on better located urban land in South Africa. In addition, the paper presents observations from a case study of Gauteng Province in which the PSS was applied (Biermann & Van Ryneveld, 2007).

Problems with previous approaches to housing delivery programmes, which led to the development of the PSS, were described as follows (Biermann & Van Ryneveld, 2007):

- At the time of the study, despite large scale delivery, the housing backlog had still increased; this was attributed to rapid urbanisation
- The peripheral low-density nature of housing delivery programmes reinforced apartheid era spatial patterns; tying the urban poor to land far from opportunities
- The key challenge preventing housing delivery in more central locations was understood to be insufficient housing subsidies

The PSS initially performed spatial multi-criteria analyses to assess land's suitability for low-income housing, including consideration of the cost of bulk infrastructure (Biermann & Van Ryneveld, 2007).

The system was further developed to perform cost-benefit analyses, taking into consideration the burden that peripheral housing locations have on residents and municipalities (including employment access and resource use efficiency), as well as considering the change in costs over time for the difference scenarios (low density on the urban periphery vs high density on well-located land) (Biermann & Van Ryneveld, 2007).

Gauteng was the selected study area; at the time, the most populous and rapidly growing province (Biermann & Van Ryneveld, 2007). A sample of 30 possible sites were identified and stratified according to a suitability index (very low, low, medium and high suitability) based on the following criteria: macro-accessibility (weighted 40%); geotechnical suitability (weighted 20%); agricultural importance (20%); and ecological sensitivity (20%). Of the 30 sites, 3 had very low suitability, 9 had low suitability, 10 had medium suitability, and 8 had high suitability. Costs were calculated based on the assumption that each site would be allocated 9375 households. 3 different suites of housing delivery configurations were defined, in which each suite comprised a range of housing solutions in specified proportions (see Figure 4). These suites were applied according to 3 delivery options. In delivery option 1, Suite 1 was applied to all 30 sites, and the consequent project costed. In delivery option 2, Suite 2 was also applied to all 30 locations, and the unused land (consequent of the denser form), was costed separately. In delivery option 3, Suite 3 was only applied to 6 sites, chosen for their proximity to existing dense nodes, while the remaining 24 sites were assigned suite 2.

	Percentage distribution of Gross Residential Density			
	% of units @ 25 / ha	% of units @ 40 / ha	% of units @ 80 / ha	% of units @ 95 / ha
Suite 1	100	0	0	0
Suites 2	30	30	30	10
Suite 3	0	25	50	25
Typology description	Site area 250m ² ; Frontage 15m, Standard plot, 1 dwelling unit per plot.	Area 120m ² ; Frontage 15m, Standard plot, 1 dwelling unit per plot.	Area 8000m ² ; Frontage 65m, 2 storey walk-up.	Area 10000m ² Frontage 150m, 4 storey walk-up.

Figure 4 - Housing Typology Suites Applied in Delivery Options (Biermann & Van Ryneveld, 2007:6)

Capital and recurrent costs were calculated for each site under the various delivery options, and were assigned either to the household, or government (Biermann & Van Ryneveld, 2007). Sources of cost were as follows: land; engineering services; social amenities; travel; top structure; environmental resources; and retail goods and services.

The key finding of the study was that the total costs of the three housing delivery options were very similar, however the party to which these costs accrued differed quite substantially. It was found that the higher cost of land in more central locations higher density developments would result in households having to spend more on capital costs (assuming subsidy remained the same). It was concluded that better located, but less affordable housing is advantageous to low-income communities that are able to take advantage of the employment opportunities which are more accessible as a consequence. However, those unable to exploit these additional opportunities would in fact find living in more peripheral locations more affordable.

From this paper it is evident that a GIS based PSS has been developed that is capable of calculating the financial viability of affordable housing as a function of location. Whilst this tool would not be sufficiently flexible to evaluate inclusionary housing development viability (given that the range of

housing configurations considered is limited to four), it can be concluded that it should be technically possible to develop a PSS capable of accommodating a wide range of user defined constructions configuration necessary in the context of inclusionary housing projects.

2.2.2 Evaluating Suitable Locations for the Development and Preservation of Affordable Housing in Florida: The AHS Model (Wang et al, 2012)

Wang et al's (2012) paper described the development and application of a module of the Shimberg Center for Housing Studies' Florida Affordable Housing Suitability Model (AHS), a GIS based PSS comprising several modules. The module discussed was intended to aid affordable housing policy decision making in Orange County, Florida, through SMCA (Spatial Multi-Criteria Analysis), in which a range of factors were considered that had been determined relevant to affordable housing location (Wang et al, 2012). The factors were distributed amongst sub-categories within four main groups, and weights assigned using pair-wise comparison, based on input from "local planners, housing experts, and the community" (Wang et al, 2012:7). Each factor was scored on internally normalised scales of 0 to 25 (Wang et al, 2012).

The factors were as follows:

- Residential Suitability
 - Physical Infrastructure and Environment
 - Soils (corrosivity; shrink-swell potential)
 - Ambient (noise; odours; respiratory dangers)
 - Hazards and Incompatibilities (flood zones; conservation land)
 - Neighbourhood characteristics
 - Educational Quality
 - Poverty Incidence
 - Educational Attainment
 - Household Income
 - Violent/Property Crimes
 - Neighbourhood Accessibility (Distance by bike/walk)
 - Transit Stops
 - Elementary Schools
 - Daycare
 - Public Safety (Fire/Police Stations)
 - Healthcare
 - Recreation
 - Retail
- Rental Housing Costs (block rent vs block household income)
- Driving Costs (achieved by regressing trip data and land use/urban form so that trips could be estimated based on land use/urban form in any parcel)
- Transit Accessibility (takes routes, frequencies and accessibility from transit stop to employment opportunities into account)

The study evaluated 202 properties within the study area, that either belonged to an affordable housing programme at the time, or had previously belonged to one. The suitability indices of these properties were then compared with the county average, which had been established using the AHS model in a prior study.

Properties that had previously belonged to affordable housing programmes were found to be better suited to affordable housing than the average county property. Properties that remained part of

affordable housing programs were less well suited, but were still better than the county average; indicating that policy would need to be revised to ensure programmes could retain best suited properties.

Of significance to the inclusionary housing model, it was noted that through evaluation of socio-economic indicators, “deconcentrating affordable housing, and mixing it with middle- and high-income residences, is the best chance to break the negative reinforcing feedback associated with poverty traps” (Wang et al, 2012:5).

2.2.3 Helping Put Theory into Practice for Planning Sustainable Communities: A GIS Tool for Measuring Transit Accessibility (Thompson et al, 2012)

The paper by Thomson et al (2012) introduced the parcel accessibility evaluation module of the Shimberg Center for Housing Studies’ AHS tool, which evaluates the range of opportunities accessible from each parcel are considered; represented by an accessibility score (Thompson et al, 2012).

The accessibility score comprises two components: a ‘walk score’, and an ‘employment access score’; both scaled to a value between 0 and 25, and then added to yield a total score out of 50 (Thompson et al, 2012). The ‘walk score’ represents the distance from every location to the nearest transit stop within an 800m buffer (Thompson et al, 2012), and was calculated first by selecting 5000 random points within the study area, establishing distance values to their nearest transit stops, and then calculating values for all surrounding locations using an inverse-distance weighting technique with these known values (Thompson et al, 2012). All values were then converted to a score between 0 and 25 using linear transformation (Thompson et al, 2012). The ‘employment access score’ was then calculated using a GIS network analysis tool developed origin-destination matrix, which calculated the least-cost trip (established by dividing route alternatives with their corresponding frequencies) between each origin-destination pair (Thompson et al, 2012). All transit stops were considered to be ‘origins’, but only transit stops within 800m walking distance of a major employment node (nodes with at least 100 employees – obtained through a primary data collection process) were considered to be ‘destinations’ (Thompson et al, 2012). The average of all the least-cost trips from each ‘origin’ to all ‘destinations’ accessible from that transit stop is then calculated for each origin, and then converted to score between 0 and 25 using linear transformation, which represents the ‘employment access score’ (Thompson et al, 2012).

The tool was used to evaluate the accessibility of 32 602 affordable housing dwelling units in Central Florida; it was found that only 25% of these developments were placed in the highest accessibility quartile. Therefore, it was concluded that the majority of low-income households in this region were potentially under additional financial strain due to their location of residence.

2.2.4 Allocation and Preservation of Affordable Housing: A Spatially Discriminated Supply-Demand Analysis Based on Parcel Level Employment Assignment (Arafat et al, 2012)

The paper by Arafat et al (2012) introduces a module of the Shimberg Center for Housing Studies’ AHS tool which identifies suitable locations for affordable housing in terms of supply-demand indices for zones across Orange County, Florida. The indices took into consideration existing affordable housing stock availability (supply), and employment density (demand). The methodology adopted was as follows:

- Parcel-level employment was mapped
 - Census block tax and employment data was translated to parcel level
- Origin-Destination cost matrix was produced to determine employment accessibility

- ArcGIS Network Analyst tool was used to find least cost paths between 5000 randomly placed origins and destinations distributed across the study area
- Three network distance buffers were applied: less than 0.5 miles was assigned to walking, 0.5 miles to 4 miles was assigned to cycling, 4 to 10 miles was assigned to driving
- Comparison of employment density and AHI (Assisted Housing Inventory) units
 - Employment opportunities (i.e.: demand generation) was calculated according to the three network buffer scales (walking, cycling, driving)
 - Supply of AHI units (vacancies) were established through review of AHI data
 - Target population group was categorised as either very low-income (below 30% of area mean income) or low-income (between 30% and 80% area mean income)
 - Results were standardized using a z-score
- Mapping of the spatial mismatch
 - Z-scores of the 5000 data points were mapped

Based on the findings of this study, it was concluded that the supply of affordable housing in the study area was insufficient, and not located sufficiently close to employment opportunities.

2.2.5 GIS for Low-cost Housing Development: A Case Study for the Evaluation of Vacant Land in North Western Windhoek (Nakanyete, 2009)

The study by Nakanyete (2009) performed GIS analysis to evaluate the suitability of vacant land for low-cost housing development in north-western Windhoek, Namibia, using ILWIS 3.3 and ArcView 3.3. Factors considered by the study were as follows:

- Slope gradient (construction cost impact)
- Vacant Land (land not available excluded)
- Dry Land (bodies of water excluded)
- Existing roads (accessibility considered)

Across the 188.5 km² study area, it was found that only 14.2 km² was vacant, dry, and sufficiently flat to develop low cost houses for 46 035 families.

2.2.6 GIS Based Tool to Measure TOD (Fard, 2013)

The study by Fard (2013) intended to address a “lack of an appropriate practical and spatial measurement tool for measuring the level of transit oriented development” (Fard, 2013), through the development of a GIS based tool. The research method was as follows:

- Factors considered relevant indicators of successful TOD were established through literature review
- Data model developed, and data obtained for chosen study area
- GIS model developed and tested
- Perform Spatial Multi Criteria Analysis (SMCA) to yield TOD index
- Map results

The following key points were noted in development of the model:

- Tessellation with 300m x 300m cells was applied over the map using Fishnet function; several cell sizes had been considered using Union, Near and Spatial join to determine most suitable size (Fard, 2013:19)
- Arnhem Nijmegen City Region, Netherlands was the chosen study area, with only secondary data being used, which was sourced from ‘ITC former projects archive’, ‘ESRI Nederland’, ‘CBS

websites (Centraal Bureau voor de Statistiek)', 'DANS (Data Archiving and Networked Services)', 'Open Street Map', and 'Google Maps' (Fard, 2013)

- "Because CBS data was provided at neighbourhood level it had to be disaggregated to the grid of 300x300 meters square cells" (Fard, 2013:21); requiring the spatial analytical processes, data apportion for non-coterminous polygons, to be applied:
 - Overlaying of base grid over CBS demographics layer
 - Calculating proportion of each variable's value for all fragmented features
 - Dissolving all segments of cells based on the unique cell ID
- To establish degree of "mixed-use-ness" the equation $\frac{\Sigma S_c}{\Sigma(S_c + S_r)}$ was used, where ΣS_c was total area of commercial land use within the cell and the adjacent 8 cells, and ΣS_r was the total area of residential land use within the cell and the adjacent 8 cells.
- In cells without residential or commercial land uses simultaneously, to avoid undefined values, a conditional expression assigned zero to such cases.

2.2.7 Geographical Information Systems and Urban Management (Răduț & Chițu, 2009)

In their article on GIS and urban management, Radut & Chitu (2009) highlights some of the key technical capabilities of GIS which are increasingly being employed, not only for administrating and monitoring, but also to perform analyses that can aid urban development planning and decision making (Radut & Chitu, 2009). Relevant in the context of inclusionary housing is the observation that GIS can be used to evaluate building data across a city, through consideration of factors such as ownership, services (water, gas, electricity, telecommunication), construction materials, number of rooms, year built, taxes, roads accessing building, and public transit station/stops proximity.

2.2.8 Concluding Remarks

The GIS based systems reviewed in this sub-section are capable of establishing sites suitable for low income communities and investors, in terms of access to opportunities, spatial implications on cost of living, and spatial implications on development costs. While each of these factors are certainly of direct relevance in the context of choosing sites suitable for inclusionary developments, none were intentionally designed specifically for this application. Inclusionary housing developments are typically private sector driven initiatives, in which affordable housing units are leveraged often through an incentives scheme managed by governing authorities. Therefore, not only must an inclusionary housing PSS be capable of assessing the impact that incentives and affordable units have on the financial viability of potential projects, it must also accommodate a far wider range of construction configurations than seen on existing known systems. Therefore, a unique system, which incorporates some of the techniques seen in these existing systems, but which also incorporates functionality suited to this application, could be advantageous. In this research, the development of such a system is presented.

2.3 Summary and Conclusion

Through review of a range of South African policy documents, frameworks and legislation in section 2.1, it is evident that the democratic era began with an inherently conflicted urban development approach between NDoH and NDoT. NDoH was focused primarily on large scale low-income housing delivery programmes, reliant on cheap peripheral urban land, and consequently reinforcing the unsustainable and inequitable apartheid era spatial development patterns. As early as 1996, in recognition of the additional burden this would place on transport systems, NDoT urged against continuation of this problematic approach (see White Paper on National Transport Policy in section 2.1.2). It was only several years later when NDoH commissioned the CSIR Guidelines for Human Settlement Planning and Design (CSIR, 2000), that an alignment of visions was seen; high density and central affordable housing became a collective priority. Although reference was first made to

inclusionary housing in *Breaking New Ground* (NDoH, 2004), the 2007 Framework for an Inclusionary Housing Policy in South Africa (NDoH, 2007) presented the first thorough investigation of the opportunities and limitations that inclusionary housing policies could offer in the South African context. It was shown that inclusionary housing policy should be recognised as a necessary component in the pursuit of spatial equity. The difficulty in ensuring sufficient flexibility in the structuring of inclusionary housing policies was highlighted, in terms of accommodating the myriad spatial factors influencing the viability of projects; the key influence on private sector participation. Therefore, the document promoted a cautious approach; suggesting that while inclusionary housing policies should be guided by a vision defined at national level, they should be developed at a municipal level to suit local conditions. Therefore, it can be concluded that inclusionary housing is both congruous with the development strategies and visions of various governmental departments of South Africa, and that the lack of mechanisms through which local conditions can be considered leaves challenges that may be solved through the development of a GIS based inclusionary housing viability PSS.

Through review of literature in section 2.2 pertaining to studies in which GIS tools have been developed that facilitate the identification of sites suitable for affordable housing, it was found that many have succeeded in achieving their stated objectives. The study by Biermann & Van Ryneveld (2007) was of particular interest, since it considers the suitability of locations for low-income housing in terms of the financial implications for both their prospective residents, and public authorities; indicating that the technology exists to develop a GIS based inclusionary housing viability PSS. Further review of literature from abroad included several studies published by The Shimberg Center for Housing Studies; a research institute linked with the University of Florida, and which developed a GIS based HSM (Housing Suitability Model) comprising a suite of affordable housing site suitability indication modules. Also reviewed was a study by Fard (2013), in which a GIS based TOD index tool was developed; providing insight into possible research methodology through which to develop a GIS PSS. Finally, in a paper by Radut & Chitu (2009), the technical capabilities of GIS tools are discussed, confirming that it is indeed possible to utilise this technology to consider the specifications of a construction at parcel level.

Based on the literature reviewed, it was concluded that it is technically feasible to develop a GIS based inclusionary housing PSS, and that there is potentially a need for such a system in the context of urban South Africa.

3 Research Method

In this chapter, the research method is presented. In Section 3.1, the research methodology is presented. Section 3.1 then presents the key aims of the literature review, while section 3.3 outlines the proposed research intervention. Section 3.4 covers the initial stakeholder engagement phase, in which factors relevant to the PSS are established. Section 3.5 provides details on the selection process for the study area considered in this research, along with sources of data for this study area. Section 3.6 covers the various phases of the development process of the PSS, including development of the mathematical model, and scripting the system in Python. Finally, section 3.7 covers the identification of case study sites on which stakeholders would consider pursuing projects, to allow the PSS to be evaluated in the context of scenarios familiar to stakeholders.

3.1 Research Methodology

For stakeholders to make decisions on whether to pursue inclusionary housing projects, quantitative data is required. However, the decision-making process itself is influenced by an array of qualitative factors. Inevitably therefore, this research required a mixed method approach; an exploratory sequential mixed method design has been applied. The first phase comprised a qualitative approach in which literature was reviewed, and engagement with stakeholders possessing knowledge relevant to this study took place. The second phase used a quantitative approach with an imbedded qualitative component (collection of quantitative data, and design of a quantitative instrument/PSS, and qualitative configuration of the PSS, in order to yield quantitative outputs).

3.2 Literature Review

The literature review aimed to establish:

- Whether inclusionary housing is considered in national or regional policies or legislation
- Whether there have been any formal attempts by public authorities across the three spheres of government to introduce inclusionary housing requirements
- What the core challenges have been which have obstructed or prevented implementation of inclusionary housing requirements
- Whether GIS tools have been used in the context of low-income or inclusionary housing
- What factors have been considered in establishing site suitability for low-income or inclusionary housing

This was achieved firstly through review of a range of South African policy documents, frameworks and legislation, and then through review of various studies in which GIS tools have been developed that facilitate the identification of sites suitable for affordable housing.

It was concluded that the technical possibility to develop a GIS based inclusionary housing PSS appears to exist, and that in the context of South Africa, there is potentially a need for such a system.

3.3 Research intervention

Private sector property developers will only pursue projects which are financially viable. To ensure an inclusionary housing project can be financially viable, typically, public authorities grant land use rights concessions. The scale of concession required is linked to the proportion of the development allocated to affordable housing, the definition of affordability, factors linked to the land parcel considered, and specification of construction.

Many of the factors linked to the considered land parcel operate spatially; for example, the value of a land parcel, and rental income potential, are correlated with the suburb in which it is situated.

Therefore, with the aid of GIS (geographical information system), in theory it should be possible to develop a tool which can extract information linked to a specific land parcel, and with user defined inputs for the non-spatial factors, perform calculations which can estimate the financial viability of a potential project on the chosen site. The advantage of such a tool would be the efficiency and rigour with which such calculations can be performed, on any land parcel within a city's boundaries ideally. This could allow governing authorities the opportunity to efficiently evaluate the impact that various inclusionary housing policy-imposed requirements and corresponding concessions might have on project viability, through a range of contexts; thereby serving as a guide that could aid the making of policy decisions. In addition, such a system could be utilised on a case by case basis, as a tool through which governing authorities and private sector property developers can negotiate the terms of an inclusionary housing development project.

In the following sub-sections, the development process of the GIS based PSS is presented.

3.4 Stakeholder Consultation and Identification of Relevant Factors

The financial viability of a property development project is influenced by a wide range of factors; some of which operate spatially, and others which are dependent on the specification of the construction. With little precedent for inclusionary housing projects in the South African context, consultation with stakeholders involved in property development projects, from both the public and private sectors was required. The aim was to establish broad consensus over which factors should be considered in calculating the potential profit of an inclusionary housing project.

First a list of factors was drawn up (see Table 1), which was submitted to stakeholders for comment. Note that initially, it was intended that the tool would also evaluate sites for their suitability for affordable housing in terms of accessibility, hence the inclusion of factors believed to be of relevance to that aspect of the tool – however due to time constraints, and since literature review revealed that such GIS based affordable housing suitability tools have been developed with a large degree of success already (see section 2.2), the scope of the project was changed to exclude this element.

Stakeholders consulted:

- Transport and Urban Development Authority, City of Cape Town – Urban Development and Planning
- Transport and Urban Development Authority, City of Cape Town – Innovation, Research and Development
- University of Cape Town - Urban Real Estate Research Unit
- Private Sector Housing Investment Company: International Housing Solutions

Factor	Scale	Impact
Proximity to PT	Parcel	Suitability
Proximity to employment opportunities	Parcel	Suitability
Degree to which employment opportunities are accessible via PT	Parcel	Suitability
Proximity to amenities and services	Parcel	Suitability
Value of land parcel	Neighbourhood	Cost
Rental demand of land parcel	Neighbourhood	Value
Floor Space Index (FSI) of land parcel	Parcel	Potential
Municipal rates	Parcel	Cost
Privately Owned/Government Owned	Parcel	Suitability
UDZ status and proximity to UDZ zones	Neighbourhood	Value
% floor area devoted to low, medium and upper income units and rental amount for each category, including annual increase percentage over x number of years	Parcel	Configuration
Average occupancy percentage per month per year	User Defined	Value
Number of parking bays per unit	Parcel	Cost
% floor area reserved for retail/commercial/residential	User Defined	Configuration
Additional tax break on development costs	Parcel	Value
Monthly government subsidy	Parcel	Value
Construction Cost	Parcel	Cost
Annual building maintenance costs	Parcel	Cost

Table 1 - Initial List of Factors

Based on stakeholder feedback, the list was refined to include only those factors listed in Table 2.

The factors were divided into four categories, namely *Suburb*, *Site Specific*, *Project*, and *General*, where *Suburb* data is applicable to an entire suburb; *Site Specific* data is only relevant to the specific land parcel being evaluated; *Project* data is configured by stakeholders for each project on each site; and *General* is configurable by stakeholders for all projects across sites. The resolution/scale of factor data required to perform a project viability calculation on a specific site, is specified as either *Parcel*, *Precinct*, or *Global*. *Parcel* level is the finest grain data requirement, where site specific information is needed. *Precinct* level is a lower resolution data requirement, where assumptions can be made based on data for the entire precinct in which the site is situated. *Global* level is the lowest resolution data requirement, where the same values are applicable regardless of where the site is situated. Data is either categorised as *spatial* or *user defined*. *Spatial* data is dependent on the land parcel's location, while *User Defined* data is independent of the land parcel's location, and can be configured according to the preferences of the stakeholders.

Item	Factor	Category/Resolution	Units	Impact	Data Type	Description
1.1	Vacant Land Cost	Suburb/Precinct	Rand per m ²	Cost	Spatial	Cost of vacant land per suburb per m ²
1.2	Developed Land Value Per Land Use	Suburb/Precinct	Rand per m ²	Value	Spatial	Value of completed construction per suburb, per land use, per m ²
1.3	Rental Income Per Land Use	Suburb/Precinct	Rand per m ²	Value	Spatial	Rental income of completed construction per suburb, per land use, per m ²
1.4	Municipal Rates	Suburb/Precinct	Rand per m ²	Cost	Spatial	Municipal rates charged monthly upon completion of construction, according to land use zoning, per m ²
2.1	Parcel Size	Site Specific/Parcel	m ²	Potential	Spatial	Total area of selected land parcel
2.2	Current Land Use Zone	Site Specific/Parcel	N/A	Potential	Spatial	Pre-concession land use zone of selected parcel
2.3	Current Parking Zone	Site Specific/Parcel	N/A	Cost	Spatial	Pre-concession parking zone of selected parcel
3.1	Preferred* Land Use Zone	Project/Parcel	N/A	Potential	User Defined	* - In exchange for meeting inclusionary housing requirements
3.2	Preferred* Parking Zone	Project/Parcel	N/A	Potential	User Defined	* - In exchange for meeting inclusionary housing requirements
3.3	Land Use Distribution	Project/Parcel	% of Construction	Configuration	User Defined	Residential/Office/Retail (Dependant on allowance per parcel zoning)
3.4	Residential Units Type	Project/Parcel	% of Construction	Configuration	User Defined	% of residential floor area allocated to 0beds/1beds/2beds/3beds
3.5	Residential Distribution*	Project/Parcel	% of Construction	Configuration	User Defined	* - in exchange for concessions: % of residential floor area allocated to low-income/medium income/open market units
3.6	Low/Medium Income and Open Market Rent Discount Factors*	Project/Parcel	% of open market values	Cost	User Defined	* - Definition of low/medium income, and open market inclusionary housing project rental discount factors
3.7	Open Market Residential Sale Price Discount Factor*	Project/Parcel	% of open market values	Cost	User Defined	* - Definition of low/medium income, and open market inclusionary housing project rental discount factors
3.8	Construction Duration	Project/Parcel	Months	Cost	User Defined	Estimated duration of construction on selected parcel
4.1	Residential Units Size	General/Global	m ²	Configuration	User Defined	Size of 0beds/1beds/2beds/3beds
4.2	Parking Bay and Manoeuvre Space Footprint	General/Global	m ²	Configuration	User Defined	Size of 1 parking bay plus manoeuvring area
4.3	Construction Costs per Land Use	General/Global	Rand per m ²	Cost	User Defined	Construction cost per land use per m ²
4.4	Building Maintenance Costs	General/Global	Rand per m ²	Cost	User Defined	Annual maintenance cost of completed construction per m ²
4.5	Loan Interest Rate	General/Global	% Per Annum	Cost	User Defined	Interest rate on loan to fund project

Table 2 - Inclusionary Housing Project Factors

3.5 Study Area and Data Sources

With the relevant factors identified, a study area was defined, and data availability for this study area had to be established.

3.5.1 Study Area

While the research objective is for the PSS to function in any South African urban, a study area was defined that would allow the mathematical model to be developed, evaluated and calibrated.

Based on preliminary discussions, it emerged that City of Cape Town has well maintained spatial data, some of which is publicly accessible via its Open Data Portal (City of Cape Town [CoCT], 2018). Realisation of greater spatial equity is a core objective driving the pursuit of inclusionary housing policy development. Spatial equity is linked with accessibility, and hence, access to opportunity. Therefore, inclusionary housing is arguably most relevant in the context of central urban areas. It is for this reason that only more central neighbourhoods of Cape Town, within a 10km radius of the city centre, have been included in the study area (see Figure 5). While mostly affluent, several lower income neighbourhoods were contained within the boundary; allowing the impact of cross-subsidisation to be assessed in comparison with that of more affordable land.

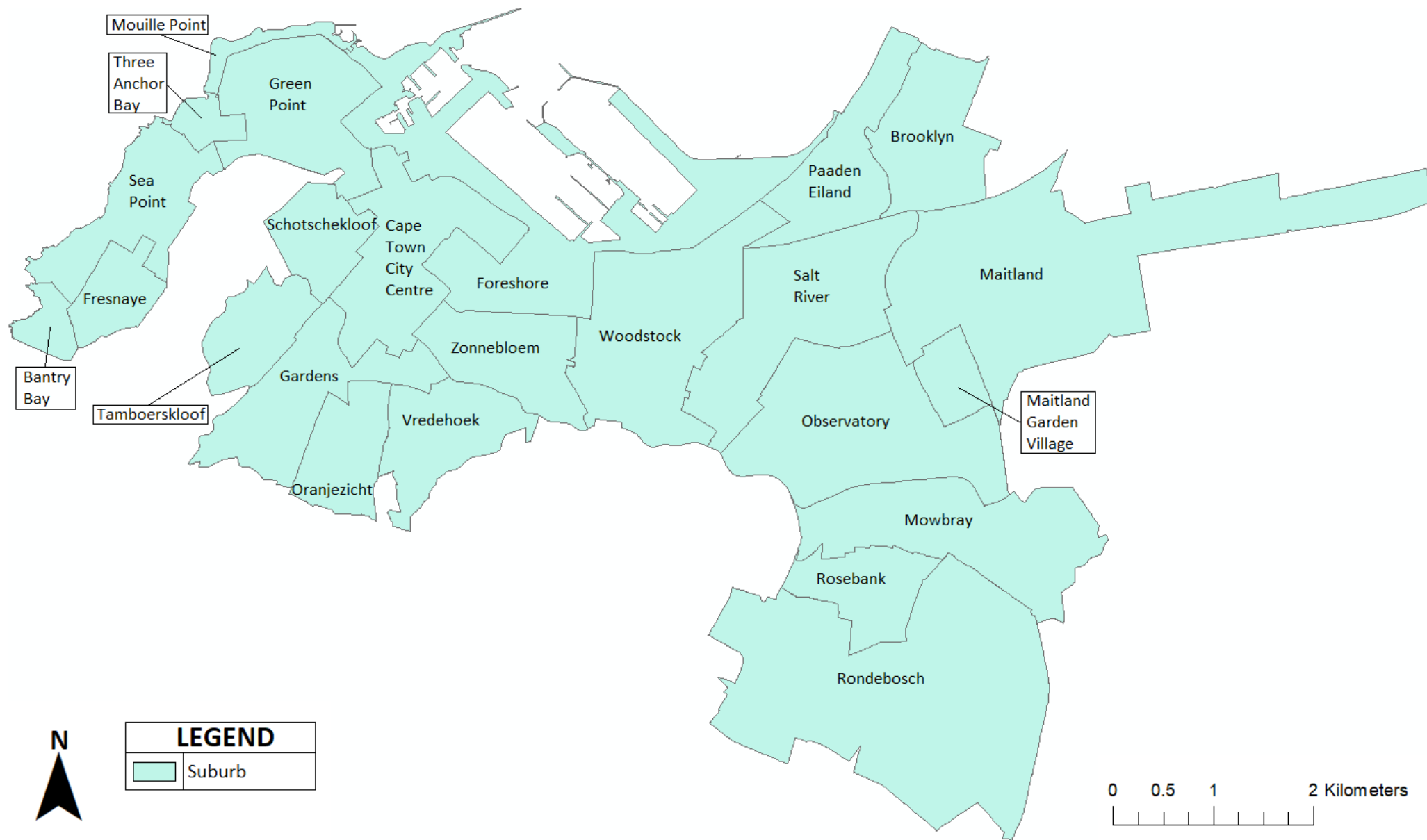


Figure 5 - Study Area

3.5.2 Suburb - Market Data

Suburb data for market driven factors 1.1 through 1.3 (see Table 2, section 3.4) is collected, and updated typically on an annual basis, by several private sector property analysis consultancies; including CMA and Lightstone. For research purposes, only data from CMA for 2012 and prior could be sourced free of charge. The data obtained comprises tables for each factor, listing each suburb in Cape Town, and the corresponding value per m² of floor area. Extracts of the relevant tables can be seen in Figure 6 through Figure 8. Note that while factor 1.2 data is of a higher resolution than 1.1 and 1.3 (i.e.: suburb level, rather than suburb group level), higher resolution data for 1.1 and 1.3 can be obtained for a fee (established through email correspondence with Lightstone).

Average Vacant Land Prices (R/m2) for 2011 / 2012			
Area	No. of Plots Sold	Sum of Size (m²)	Avg. R/m²
Atlantic Seaboard	6	2587	R 10 754
City Bowl	6	2636	R 4 991
Constantiaberg	17	70785	R 1 540
False Bay	34	24879	R 1 540
Hout Bay	5	6901	R 1 359
Northern Suburbs	9	6466	R 841
South East Suburbs	4	2136	R 1 120
Southern Suburbs	11	11520	R 2 506
Western Seaboard	34	20589	R 2 006

Figure 6 – Factor 1.1) CMA Market Data 2011/2012: Average Vacant Land Cost Per Suburb Group (Lew Geffen Sotheby's International Realty, 2012)

Average Sale Price(R/m2) By Year and Suburb						
Area	2007	2008	2009	2010	2011	2012
Atlantic Seaboard	R 14 903	R 16 024	R 18 538	R 18 913	R 19 557	R 21 618
Bantry Bay	R 12 191	R 21 264	R 21 225	R 24 062	R 29 078	R 36 795
Camps Bay	R 26 441	R 12 340	R 18 207	R 17 599	R 15 289	R 16 211
Clifton	R 46 825	R 40 249	R 50 642	R 30 986	R 37 465	R 50 195
Fresnaye		R 17 393	R 15 580	R 16 957	R 18 473	R 16 357
Granger Bay	R 41 667		R 36 356	R 46 806	R 30 361	R 42 914
Greenpoint	R 14 535	R 17 052	R 16 420	R 17 056	R 16 912	R 17 518
Llandudno		R 5 824	R 11 931	R 13 551	R 9 522	
Mouille Point	R 21 507	R 29 880	R 23 208	R 23 931	R 25 794	R 28 005
Sea Point	R 13 690	R 14 650	R 16 200	R 16 796	R 17 816	R 17 660
The Waterfront			R 50 753	R 42 499	R 42 222	R 44 506
Three Anchor Bay	R 12 712	R 12 035	R 16 629	R 15 182	R 14 283	R 16 495
City Bowl	R 12 683	R 13 680	R 14 379	R 15 055	R 15 027	R 14 446
Bo-Kaap			R 11 201	R 10 466	R 9 544	R 9 794
Cape Town	R 15 738	R 15 107	R 16 486	R 16 787	R 16 519	R 15 140
de Waterkant	R 19 952		R 19 401	R 20 231	R 20 763	
Devils Peak	R 9 143	R 16 854	R 13 142	R 11 602	R 12 192	R 12 499
Gardens	R 13 602	R 13 587	R 15 582	R 16 570	R 15 844	R 16 870
Harbourfront	R 10 275	R 17 174	R 15 481	R 18 024	R 17 441	R 21 303

Figure 7 – Factor 1.2) CMA Market Data Extract 2007 to 2012: Average Sale Price Per Suburb (Lew Geffen Sotheby's International Realty, 2012)

Annual Rental Return on Investment By Area				
Area	Average rent per month R/m ²	Average rent per annum R/m ²	Average sales price [2011] Price R/m ²	Rental return on investment %
Atlantic Seaboard	R 133	R 1 596	R 19 557	8%
City Bowl	R 133	R 1 596	R 15 027	11%
Constantiaberg	R 95	R 1 140	R 7 792	15%
False Bay	R 58	R 696	R 6 873	10%
Hout Bay	R 94	R 1 128	R 7 971	14%
Northern Suburbs	R 56	R 672	R 5 011	13%
South East Suburbs	R 51	R 612	R 4 600	13%
Southern Suburbs	R 85	R 1 020	R 9 464	11%
Western Seaboard	R 91	R 1 092	R 6 198	18%

Figure 8 – Factor 1.3) CMA Market Data 2011: Average Rental Return Per Suburb Group (Lew Geffen Sotheby's International Realty, 2012)

3.5.3 Site Specific – GIS Data

Site specific data for factors 2.1 through 2.3 (see Table 2, section 3.4) is maintained by City of Cape Town, and is available publicly through their Open Data Portal (CoCT, 2018).

The files utilised were as follows:

Name	Function
SL_IZNG_LAND_PRCL.shp	<ul style="list-style-type: none"> Parcel boundaries (polygon format) Parcel SG26 codes (identification) Parcel land use zoning
SL_PT1_ZONE.shp	<ul style="list-style-type: none"> Parking Zone PT1 boundaries (polygon format)
SL_PT2_ZONES.shp	<ul style="list-style-type: none"> Parking Zone PT2 boundaries (polygon format)
SL_OFC_SBRB.shp	<ul style="list-style-type: none"> Suburb boundaries (polygons format)

Table 3 - City of Cape Town GIS Data

3.5.4 Legislated Land Use Rights

In Cape Town, land use distribution (factor 3.3, Table 2) is constrained by rules within the Western Cape government's 2015 Planning By-Law (City of Cape Town [CoCT], 2015). Every land parcel is assigned a zoning code, which corresponds with the permitted land use functions (see Table 4), and maximum floor area a construction may have (see Table 5); the maximum floor area is either controlled through a floor factor (an equation linked to the area of the land parcel), or a fixed maximum floor area (independent of the area of the land parcel).

Land Use Zone	Land Use Zone Description	Residential	Office	Retail
SR1	Single Residential	Yes	No	No
GR1/2/3/4/5/6	General Residential	Yes	No	No
LB1	Local Business	Yes	Yes	No
LB2	Local Business	Yes	Yes	Yes
GB1/2/3/4/5/6/7	General Business	Yes	Yes	Yes
MU1/2/3/4	Mixed Use	Yes	Yes	Yes
GI1/2	General Industry	No	Yes	Yes

Table 4 - Land Use Zoning: Permitted Functions

Land Use Zone	Floor Factor	Floor Area
SR1 (plot $\leq 650\text{m}^2$)	$1 \times \text{Plot Area}$	N/A
SR1 (plot $> 650\text{m}^2$)	N/A	1500m^2
GR1	$\text{Plot Area} - 14 \times \sqrt{\text{Plot Area}} + 48$	N/A
SR2/GR2/GR3/LB1/LB2	$1 \times \text{Plot Area}$	N/A
GR4/GB1/MU1/GI1	$1.5 \times \text{Plot Area}$	N/A
GB2/GB3	$2 \times \text{Plot Area}$	N/A
GR5	$2.5 \times \text{Plot Area}$	N/A
GB4	$3 \times \text{Plot Area}$	N/A
GB5/MU2/GI2	$4 \times \text{Plot Area}$	N/A
GR6	$5 \times \text{Plot Area}$	N/A
GB6/MU3	$6 \times \text{Plot Area}$	N/A
GB7	$12 \times \text{Plot Area}$	N/A

Table 5 - Land Use Zoning: Permitted Floor Area

Parking requirements for a land parcel are calculated according to the land uses on that parcel, floor area for each of these land uses, and whether the parcel falls within a concessionary parking overlay zone (PT1 and PT2; intended to reduce the number of parking bays in areas with good public transport links). The legislated requirements are summarised in Table 6. Note that an additional two parking zones were created for the purpose of this study (PT3 and PT4) to allow a mechanism through which more lenient parking requirement concessions can be awarded to developments meeting inclusionary housing requirements (i.e.: these are not legislated parking zones, and are included for research purposes only).

Land Use	Standard Areas	PT1 Areas	PT2 Areas	PT3	PT4
SR1	2 bays if ≥ 350m ² , 1 bay if < 350m ²	1 bay	No bays	No bays	No bays
SR2	1 bay if ≥ 100m ² , no bay if < 100m ²	No bays	No bays	No bays	No bays
GR1/2/3/4/5/6	2 bays per DU	1.25 bays per DU	1 bay per DU	0.75 bays	No bays
LB1/2 (and resi)	2 bays per DU	1.25 bays per DU	1 bay per DU	0.75 bays	No bays
LB1 (and office)	4 bays per 100m ² GLA	2.5 bays per 100m ² GLA	1 bay per 100m ² GLA	0.75 bays per 100m ² GLA	No bays
LB2 (and retail)	4 bays per 100m ² GLA	2 bays per 100m ² GLA	1 bay per 100m ² GLA	0.75 bays per 100m ² GLA	No bays
GB1/2/3/4/5/6/7 (and resi)	2 bays per DU	1.25 bays per DU	1 bay per DU	0.75 bays per 100m ² GLA	No bays
GB1/2/3/4/5/6/7 (and office)	4 bays per 100m ² GLA	2.5 bays per 100m ² GLA	1 bay per 100m ² GLA	0.75 bays per 100m ² GLA	No bays
GB1/2/3/4/5/6/7 (and retail)	4 bays per 100m ² GLA	2 bays per 100m ² GLA	1 bay per 100m ² GLA	0.75 bays per 100m ² GLA	No bays
MU1/2/3 (and resi)	2 bays per DU	1.25 bays per DU	1 bay per DU	0.75 bays per DU	No bays
MU1/2/3 (and office)	4 bays per 100m ² GLA	2.5 bays per 100m ² GLA	1 bay per 100m ² GLA	0.75 bays per 100m ² GLA	No bays
MU1/2/3 (and retail)	4 bays per 100m ² GLA	2 bays per 100m ² GLA	1 bay per 100m ² GLA	0.75 bays per 100m ² GLA	No bays
GI1/2 (and office)	4 bays per 100m ² GLA	2.5 bays per 100m ² GLA	1 bay per 100m ² GLA	0.75 bays per 100m ² GLA	No bays
GI1/2 (and retail)	4 bays per 100m ² GLA	2 bays per 100m ² GLA	1 bay per 100m ² GLA	0.75 bays per 100m ² GLA	No bays

Table 6 - Parking Requirements Per Land Use and Parking Zone

3.5.5 Municipal Rates

Property owners are charged municipal rates (factor 1.4, Table 2) on a monthly basis according to Equation 1. Each municipality determines a set of tariff rates which correspond with the zoning of a land parcel, and which are updated on an annual basis to account for inflation. Municipal valuations on properties are updated regularly. In Cape Town, tariff rates are defined in the Tariffs, Fees and Charges book, the values of which are specified in Table 7 (City of Cape Town [CoCT], 2017a).

Equation 1 - Monthly Municipal Property Rates (CoCT, 2017a):

$$\text{Rates} = \frac{\text{Municipal Valuation} \times \text{Tariff Rate}}{12}$$

Zone	Tariff Rate: 0.006717	Tariff Rate: 0.013434
SR/GR	x	
LB/GB/MU/GI		x

Table 7 - Tariff Rate - Monthly Municipal Rates (CoCT, 2017a)

3.5.6 User Defined – Non-Spatial Data

User defined data (Factors 3.1 through 4.5, Table 2) must be configured by the stakeholders for each project (within legislated constraints discussed in section 3.5.4). In order to evaluate the PSS, sources containing typical values for these factors were reviewed.

AECOM's (AECOM, 2011; AECOM, 2018) annually published Africa Property and Construction Cost handbooks provides estimates on construction costs for a variety of development styles in a Rand per m² format.

To establish the typical compositions and sizes of dwelling units found in high density residential and mixed-use developments in Cape Town, the specification of several projects currently under construction in and around central Cape Town were referred to:

- 16 on Bree (16 Bree St, Cape Town - <http://16onbree.co.za/index.php#apartments>)
- Castle Rock (25 Keizersgracht St, Zonnebloem, Cape Town – <https://www.castlerock.capetown/>)
- Chapel Towers (149 Chapel St, Zonnebloem, Cape Town – <http://www.chapeltowers.co.za/floor-plans.php>)
- Obs Court (Howe St, Observatory, Cape Town – <https://www.upton.co.za/results/new-development/residential/cape-town/observatory/35/>)

3.6 Developing the Model

In this section, the process of developing the PSS is presented. The mathematical model was first developed in Excel, using initial case study sites, before re-developing the full-scale model in Python.

3.6.1 Site Selection

To allow evaluation of the mathematical model's ability to function at each stage of development, across a range of environments, as well as to assess its consistency across similar environments, five land parcels were identified within the study area (see Table 8 and Figure 9). Parcels 1.1, 3.2 and 3.3 were chosen for their similar scale, with parcel 1.1 being situated in a more affluent neighbourhood. Parcel 2.1 was chosen for its similar market factors to 1.1, but with a higher density and mixed-use allowance (GR4 vs GB7). 3.1 through 3.3 were selected and grouped due to their being situated in the same suburb, which allowed comparison of the impact that zone and parcel size had when excluding the impact of market driven factors (which would be similar for all three sites). By choosing two similar sites in the same neighbourhood (3.2 and 3.3), the model could be evaluated for consistency in similar conditions.

Site	SG26 Code	Suburb	Zone	Size (m ²)
1.1	C01600070009535000000000000	Gardens	GR4	1899
2.1	C01600070000378900000000000	Cape Town City Centre	GB7	846
3.1	C01600070011575000000000000	Zonnebloem	GR4	19557
3.2	C01600070011592900000000000	Zonnebloem	MU2	1908
3.3	C01600070014166400000000000	Zonnebloem	MU2	1341

Table 8 - Initial Site Selection

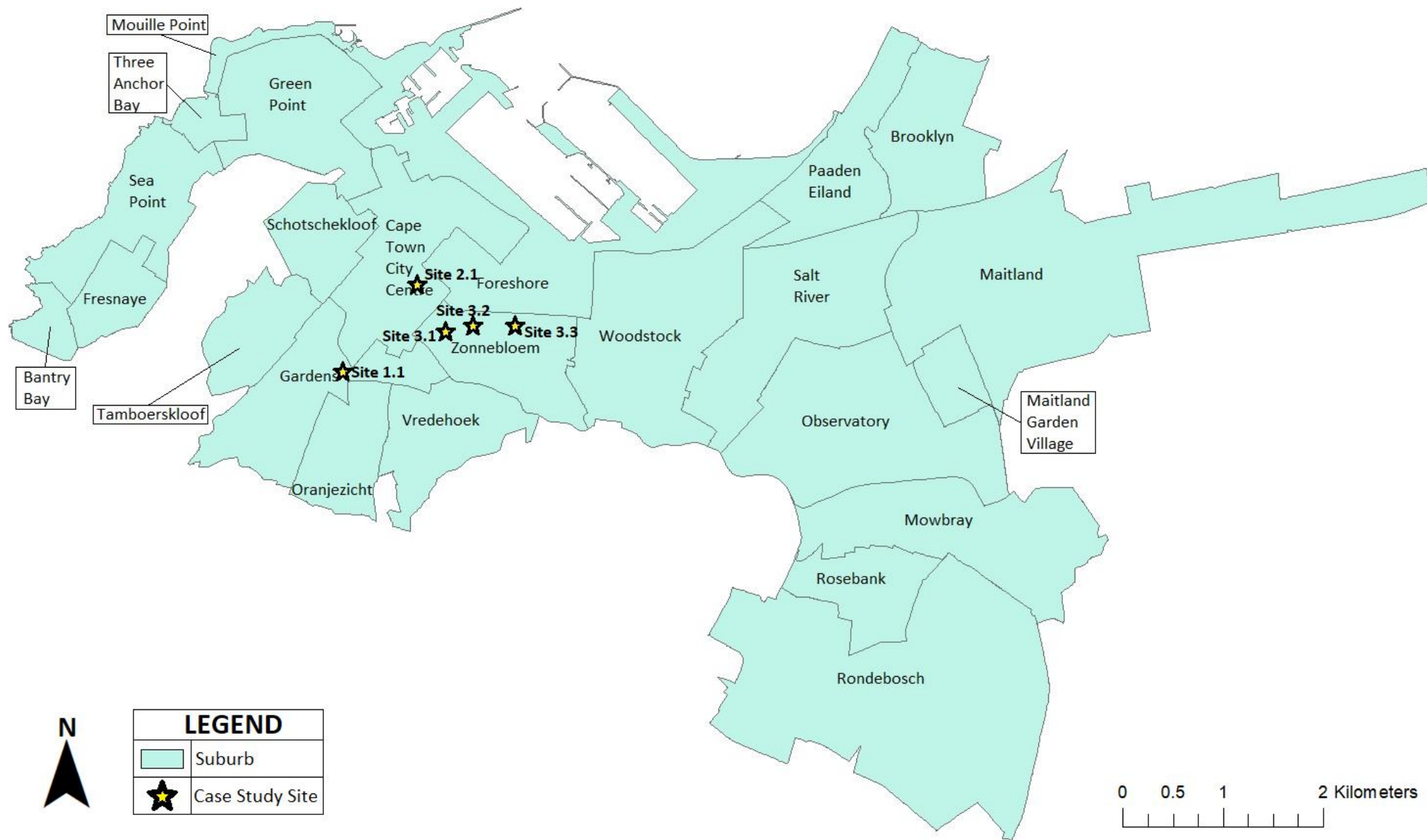


Figure 9 – Initial Site Selection Map

3.6.2 Excel Model

The first phase of development of the mathematical model took place in Excel (see Figure 10). This model comprises six modules:

- A. Spatial Data: Site Specific (Inputs)
- B. Spatial Data: Suburb (Inputs)
- C. User Defined: Project (Configurations)
- D. User Defined: Global (Configurations)
- E. Building Calculations (Outputs)
- F. Finance Calculations (Outputs)

For each module, calculations are performed on five sites simultaneously, and where required, the factors contained within these modules are duplicated for each site, to account for two development scenarios, namely: “business as usual” and “inclusionary housing with zoning concessions”. The “business as usual” scenario maximises the scale of development allowed under existing land use and parking zoning restrictions (as outlined in section 3.5.4), without any inclusionary housing requirements. The “inclusionary housing with zoning concessions” scenario maximises the scale of development under concessionary land use and parking zones (also according to regulations outlined in section 3.5.4, but for zoning which would be chosen by the stakeholders), in exchange for a stakeholder defined percentage of residential floor area being allocated to low and medium income units.

Data for module A was manually extracted for each of the sites from the obtained Shape files (discussed in section 3.5.3). Data for module B was read off the market data tables (discussed in section 3.5.2).

Where possible, module C was configured with reference to developments currently under construction in and around central Cape Town (as listed in section 3.5.4), within the zoning constraints as discussed in section 3.5.4. However, several module C factors have relevance only in the context of inclusionary housing, for which there is little precedent in South Africa. These include percentage of residential floor area allocated to low and medium income units, as well as corresponding “discount factors”. It is through discount factors that stakeholders can define the level of discount applied to (primarily) low and medium income units, relative to open market rental values (for the suburb in which the parcel is situated). In addition, allowance is made for the definition of open market rental and sale discount factors, for units within an inclusionary housing development, as a possible mechanism through which prejudice and uncertainty (that open market residential renters and investors may have towards mixed income developments), can be countered. For the sake of evaluating the model, these factors were configured as follows:

- Low-income percentage of residential floor area: 10%
- Medium income percentage of residential floor area: 10%
- Low-income Rental: 20% of open market
- Medium Income Rental: 50% of open market
- Open Market Rental (Inclusionary Housing Development Only): 90% of open market
- Open Market Sale (Inclusionary Housing Development Only): 90% of open market

At the time the Excel model was developed, reliable sources for module D factors (stakeholder configuration values) had not been established, and therefore these had to be estimated. Parking rental income per m² was estimated based on values established through review of online “classified” advertisements for typical parking bays offered for rent in and around central Cape Town. Similarly,

building maintenance costs were estimated through review of building management levies charged by residential apartment blocks in and around central Cape Town. Construction costs per land use utilised inflation adjusted 2015 STATSSA values (Statistics South Africa [STATSSA], 2015). Note that for the final Python based model presented in section 3.6.3, construction costs were estimated using AECOM handbooks for the corresponding year (as discussed in section 3.5.4).

Modules E and F contain several categories of output, listed in Table 9. Module E utilises values from modules A and C to perform calculations which determine the specification of the construction for both development scenarios (floor area allocated to each land use and configuration of residential units). Module F utilises values from modules A through E to calculate the financial implications of the construction configurations for both development scenarios. These include costs and sources of income both prior and post completion of construction. The chosen key indicators of project viability were generated equity (value of completed construction, minus value of units sold, minus any debt owed on loans to fund project), and rental yield (annual rental income minus annual expenses, divided by generated equity); established through discussion with International Housing Solutions (see section 5.1.1 for more details).

A static snapshot of the Excel based model can be seen in Figure 10.

Output Category	Output Module	Input Module	Calculation Method
Floor area per land use	E	A, C	Proportional to user distribution preference, within zoning use rights restrictions outlined in section 3.5.4
Number of dwelling units per configuration	E	A, C	Proportional to user distribution (0 beds/1 beds/2 beds/3 beds) and size preference per configuration
Number of parking bays	E	A, C	Parking zone and land use zone, and floor area/number of dwelling units per regulations outlined in section 3.5.4
Monthly municipal rates	F	B, E	Land use zone, floor area and municipal suburb valuation per unit area
Monthly building maintenance costs	F	B, D, E	Building floor area at specified rate
Monthly income through levies	F	B, D, E	Building maintenance cost and proportion of residential units sold
Monthly income through rent	F	B, D, E	Unsold building floor area per land use at market rate
Construction costs per land use	F	B, D, E	Floor area per land use at specified rate
Land cost	F	A, B	Plot size and market rate per suburb
Cost of interest on loan to fund project	F	F	Construction cost and duration at specified interest rate
Income from sold open market residential units.	F	B, D, E	Proportional to user defined percentage of residential floor area sold
Generated Equity	F	B, C, D, E	Open market value of entire completed construction, minus value of units sold, minus debt owed on loan to fund project
Rental Yield of development	F	F	Annual rental income minus annual expenses, divided by generated equity

Table 9 - List of Output Categories

3.6.3 Python Model

While Excel was a suitable platform in which to develop the mathematical model and theory behind the PSS, for the system to be capable of efficiently analysing any land parcel, the process of reading site specific GIS and suburb data had to be automated.

ArcGIS enables users to control functions and extract data through its ArcPy package, with the “Search Cursor” function allowing the reading of shape file data tables. For the “Search Cursor” function to be employed, the GIS datasets (discussed in section 3.5.3) first needed to be formatted and compiled as a single table.

3.6.3.1 Data Preparation

The “Extract Multi Values to Points” ArcPy function allows production of data tables, in which the coordinates of every point on a selected point data map is used to define rows within the table, and values of specified raster layers beneath these points are then recorded in columns corresponding to each point’s row.

The *SL_IZNG_LAND_PRCL.shp* file contains polygon data demarcating the boundaries of every land parcel in the city, specifying their respective SG26 codes (unique identification code) and land use zoning (discussed in section 3.5.4). The *SL_OFC_SBRB.shp* file contains polygons demarcating the boundaries of all Cape Town suburbs, while *SL_PT1_ZONE.shp* and *SL_PT2_ZONES.shp* contain polygons demarcating the boundaries of parking zones PT1 and PT2 (also discussed in 3.5.4). Therefore, none of these files were in a format suitable for the “Extract Multi Values to Points” function.

It was determined that it was most sensible to convert *SL_IZNG_LAND_PRCL.shp* into point data, since this file contained the highest resolution of data (parcel level), and therefore should be the driver of data extraction from lower resolution files beneath it. *SL_OFC_SBRB.shp*, *SL_PT1_ZONE.shp* and *SL_PT2_ZONES.shp* files therefore needed to be in raster format.

Before converting these files, the boundaries of the study area had to be defined using the “feature selection” tool, in which the polygons representative of the chosen suburbs were manually selected, and then exported to a new polygon file, *Suburbs_Clippped_v1.shp*. The geoprocessing “clip” tool was then applied to the *SL_IZNG_LAND_PRCL.shp*, *SL_PT1_ZONE.shp* and *SL_PT2_ZONES.shp* files, using the new suburb polygon map as a filter, generating new polygon files, *Land_Parcels_Clippped_v1*, *PT1_Zone_Clippped_v1* and *PT2_Zone_Clippped_v2* respectively. Next, these files were rasterised; a resolution of 3x3 metres was chosen, to allow land parcels’ size to be calculated with a fair degree of accuracy by counting the number of instances per SG26 code in the final table (representing the number of raster squares per land parcel). Output files from this process were *Land_Parcels_Clippped_Raster_v2*, *Suburbs_Clippped_Raster_v2*, *PT1_Clippped_Raster_v2* and *PT2_Clippped_Raster_v4*. *Land_Parcels_Clippped_Raster_v2* was then converted to point data using the “raster to points” function, outputting *Land_Parcel_Clippped_Point_For_Zone_v1*.

With the data now in the correct format, the “Extract Multi Values to Points” function was employed to update the data table within *Land_Parcel_Clippped_Point_For_Zone_v1* to include (aside from the land parcel SG26 codes and zoning already integral to this dataset), the suburb name and parking zoning for each entry. See Appendix B for the code used to generate the final table, and Figure 11 for an extract from the table; note that land use zones and suburbs were converted to numerical equivalents during the conversion processes, and parking zones are identified as being either PT1, PT2 or neither, by the presence of a “1” in the respective column.

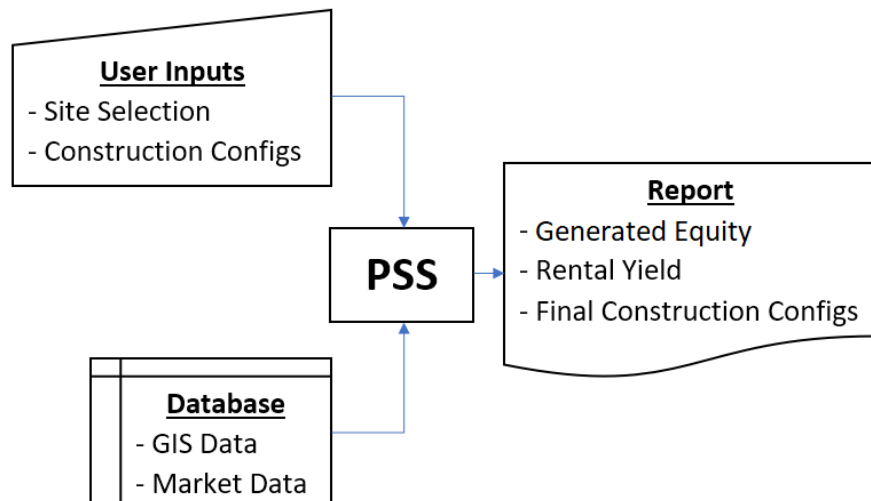


Figure 12 - PSS Data Flow Overview

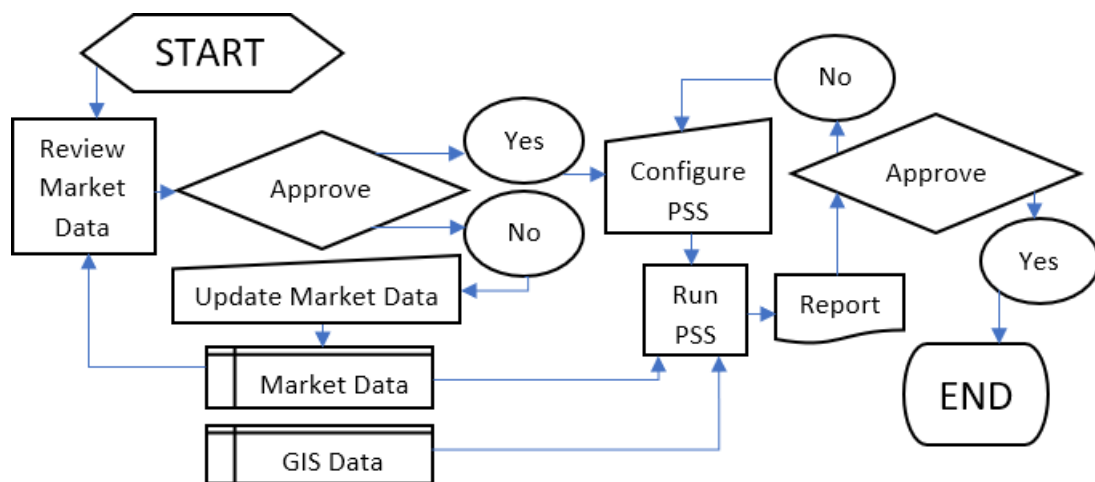


Figure 13 - PSS Implementation Process Flow

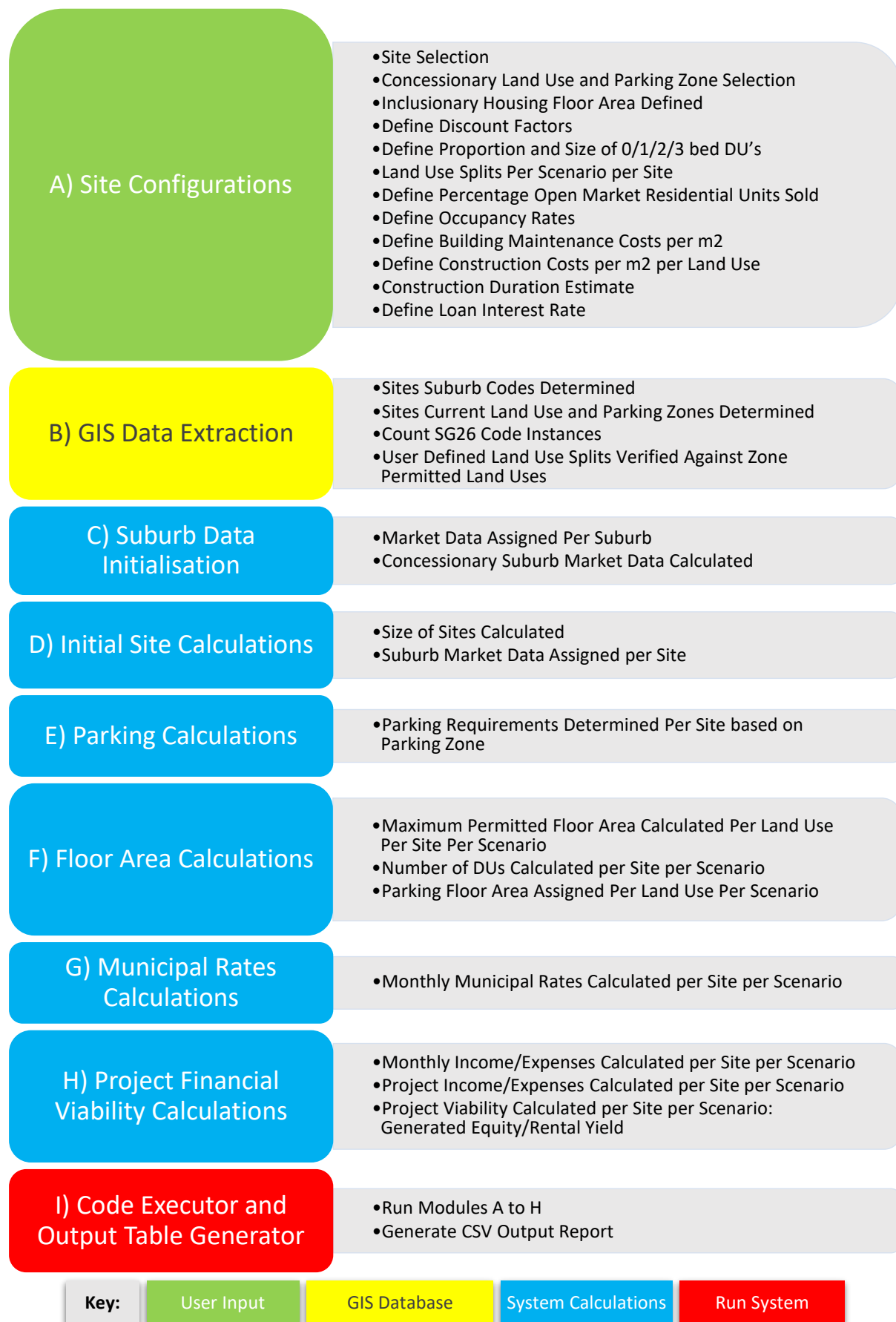


Figure 14 - GIS PSS Operation Flow Chart

Module A is the interface through which user defined variables (3.1 to 4.5, listed in Table 2) are initiated and assigned values. Through this module, the user is able to:

- Select up to five land parcels for evaluation, by entering in SG26 codes for these sites
- Select land use zoning concession by entering preferred land use zoning code per site
- Select parking zoning concession by entering preferred parking zoning code per site
- Provide construction duration estimate (in months) for both scenarios per site
- Define land use split for both scenarios per site
- Define percentage of low and medium income units (inclusionary housing scenario)
- Define proportion of 0/1/2/3-bedroom units within residential component of development
- Define floor area of 0/1/2/3-bedroom units and parking bay and manoeuvring space claim
- Define discount factors for low, medium and open market (as described in section 1.1.1)
- Define anticipated number of open market residential units sold per scenario
- Define anticipated occupancy rates
- Define building maintenance costs per m²
- Define construction costs per m² per land use
- Define interest rate on loan to fund project

Module B contains the “Search Cursor” function, utilising the relevant user defined variables from Module A to search the data table (the generation of which is discussed in section 3.6.3.1), and initiate variables for site specific spatial factors (2.1 to 2.3 listed in Table 2), and assign values as pulled from the data table. Through this module, the following is achieved:

- Sites are assigned their suburbs
- Sites are assigned their current land use zoning codes
- Sites are assigned their current parking zoning codes
- The user defined land use splits for “business as usual” scenario (configured in module A) are assessed for compatibility with the land parcels’ current land use zoning. If a prohibited land use has been assigned according to current zoning, the proportion of desired floor area assigned to the prohibited land use is re-assigned automatically to the permitted land uses, proportionally to the user defined proportions for the permitted land uses. An error message is printed in instances where an automatic adjustment was necessary, notifying the user of what adjustments took place and why.

Module C is used to initiate and assign values to spatial suburb specific factor variables (1.1 through 1.4 listed in Table 2):

- Suburb numerical values are decoded
- Market data for vacant land per m² per suburb is assigned
- Market data for completed construction per m² per suburb is assigned
- Concessionary completed construction per m² per suburb is calculated
- Municipal evaluation per m² per suburb is assigned
- Market data for rent per land use per m² per suburb is assigned
- Concessionary residential rent per income group per m² per suburb is calculated

Module D links chosen land parcels with corresponding module C data:

- The area/size of each chosen land parcel is established by counting instances per SG26 code
- The suburb of each parcel and corresponding market data for both scenarios are assigned

Module E calculates parking requirements (in per m² and per number of dwelling units formats) for the chosen land parcels, taking into consideration the land use splits and parking zoning (in accordance with municipal regulations as discussed in section 3.5.4), for both scenarios.

Module F maximises the floor area and configures the construction for each site for both scenarios through the following approach:

- The maximum floor area permitted according to zoning is calculated per site per scenario
- Floor area is assigned proportionally to user preference (or module B adjustment) per land on each site, per scenario
- Number of dwelling units of each configuration is calculated per site, per scenario
- Floor area from each land use is allocated to parking, based on parking requirements calculated in module E, per site, per scenario

Module G calculates the monthly cost of municipal rates per land parcel for both scenarios, according to zoning of the land parcel, and estimated municipal valuation (based on suburb estimate and maximised floor area per scenario), in accordance with municipal regulations (discussed in section 3.5.5).

Module H calculates the financial implications of the two development scenarios for each land parcel through the following process:

- Monthly Income Calculations (at project completion)
 - Rental income per land use, per site, per scenario
 - Levies income from sold residential units, per site, per scenario (proportional to building maintenance costs of sold units)
- Monthly Expenses Calculations (at project completion)
 - Monthly municipal rates per site, per scenario
 - Building maintenance costs per site, per scenario
- Project Expenses
 - Cost of land per site
 - Cost of construction per site, per scenario
- Project Income (at project completion)
 - Income from sold residential units, per site, per scenario
 - Income from sold residential units parking bays, per site, per scenario
- Project Viability Calculations
 - Debt at project completion per site, per scenario
 - Generated equity at project completion per site, per scenario (value of completed construction, minus value of units sold, minus any debt owed on loans to fund project)
 - Monthly profit, per site, per scenario (monthly income minus monthly debt)
 - Net rental yield, per site, per scenario (annual rental income minus annual expenses, divided by generated equity)
 - Number of years to pay of loan per site, per scenario (using monthly profit to pay of loan)

Module I consists of code which executes modules A through H. Each time it is run, a csv output table is generated, containing the specifications of developments on each site, for both scenarios, as well as their corresponding financial viability assessment results.

3.7 Case Study - Applying the PSS

To ensure the PSS's ability to aid with decision making could be evaluated with an appropriate degree of confidence, identification of sites on which stakeholders would consider pursuing inclusionary housing projects was desired. Once the Python based PSS had been developed and debugged to a level where it could be run on any site within the study area, a series of audio recorded meetings were held in which the system was presented to stakeholder groups listed below. During these meetings, the merits/opportunities, as well as shortcomings with the PSS, from their points of view, were discussed (the main points raised during these meetings are presented in section 5.1). The meetings were concluded with a request for assistance in identifying sites within the study area on which they would consider pursuing inclusionary housing development projects.

Stakeholders groups consulted:

- Private Sector Property Development Company: International Housing Solutions
- Private Sector Property Development Company: Anonymous (referred to as "Developer A" below)
- Transport and Urban Development Authority, City of Cape Town – Housing
- Transport and Urban Development Authority, City of Cape Town – Urban Development and Planning

A process was followed whereby the "site configuration" module of the PSS (Module A - discussed in section 3.6.3.2) was configured with the input received from stakeholders. The results of this process are presented in Table 10, and the case study site locations can be seen in Figure 16. Where relevant, additional details are provided in the paragraphs which follow.

Consistent with the "80:20" model (80% open market, 20% affordable) adopted by Developer A for its inclusionary housing development in Cape Town (discussed in more detail in section 5.1.2), the decision was made to maintain this requirement across all sites. 10% of the total residential floor area was assigned to low-income units, and another 10% to medium income units. Low and medium income units' rentals were set to 20% and 50% of open market suburb linked rental estimates respectively. Land use splits for each scenario, in terms of percentage floor area assigned to each land use, were assigned based on permissible land uses according to zoning, and ratios typically found in developments of their nature (refer to section 3.5.6). Similarly, assignments of residential floor area to each unit type and size (0bed, 1bed, 2bed, 3bed), was done through evaluation of developments listed in section 3.5.6.

Since the suburb market data for 2011 (discussed in section 3.5.2) was several years out of date, and was from a period in which the housing market had been through a severe recession (see Figure 15), it was decided to pursue more up-to-date data for the specific suburbs in which the chosen sites were situated. This would allow evaluation of the impact that different market conditions might have on project viability, as well as allow the generation of outputs more easily interpreted by stakeholders. In the absence of research funding to procure current market data from Lightstone or CMA, an alternative method was established. As before, the following datasets were required: vacant land cost per suburb per m²; sale price per suburb per m²; rental return per suburb per m². For each of these categories, online advertisements posted by real-estate agencies and property developers were reviewed, for three properties for each suburb where possible (see Table 11). Since asking prices for off-plan developments are typically not negotiable, it was decided to only consider this style of property in the pursuit of sale price data. Similarly, for rental price data, only recently completed developments (therefore properties in a good state of repair) were considered. Where vacant land for sale could not be found for the respective suburb, adjacent suburbs, or suburbs with similar vacant

land values from 2011 data were used as a proxy (as specified in Table 11). Note: because 2011 vacant land values were obtained for all suburbs, in instances where 2018 values were not available for specific suburbs, suburbs which had both 2011 and 2018 data, and which had similar values to the suburb for which 2018 data was missing, could be relied upon as a proxy.

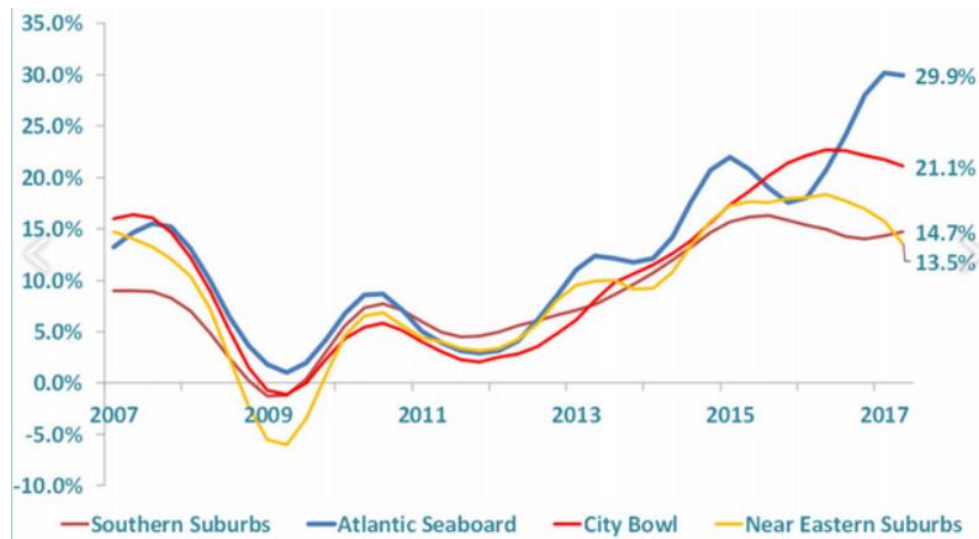


Figure 15 - Cape Town Property Market (2007 - 2017) (Erasmus & Loos, 2017)

Construction costs for both 2011 and 2018 were required; AECOM's 2011 (AECOM, 2011) and 2018 (AECOM, 2018) Africa Property and Construction Cost handbooks were consulted, with equivalent specifications being assumed for both data-sets:

2011 Construction Costs

- Residential: "Prestige apartment block specification" (AECOM, 2011:45) was assumed, due to the scale of the construction, however since it was not intended to develop luxury apartments, the lower estimate of R9000/m² was adopted
- Office: "High-rise tower block with standard specification" (AECOM, 2011:43) was assumed, with the mean being adopted, at R8700/m².
- Retail: "Neighbourhood centres" (AECOM, 2011:44) specification was assumed, with the mean being adopted, at R6000/m².
- Parking: "Parking in basement" (AECOM, 2011:43) specification was assumed, with the mean being adopted, at R3750/m².

2018 Construction Costs

- Residential: "Prestige apartment block specification" (AECOM, 2018:38) was assumed, due to the scale of the construction, however since it was not intended to develop luxury apartments, the lower estimate of R13400/m² was adopted
- Office: "High-rise tower block with standard specification" (AECOM, 2018:37) was assumed, with the mean being adopted, at R12950/m².
- Retail: "Neighbourhood centres" (AECOM, 2018:37) specification was assumed, with the mean being adopted, at R9350/m².
- Parking: "Parking in basement" (AECOM, 2018:37) specification was assumed, with the mean being adopted, at R5600/m².

Site	1	2	3	4	5
SG26 Code	C016005200000 5510000000000	C016000700026 1550000000000	C016000700005 6670000000000	C016000700148 7910000000000	C016000700173 1790000000000
Address	4 Oliver Road, Sea Point	Obs Court Howe St, Observatory	6 Bloemhof St, Zonnebloem	100 Buitengracht St, Cape Town City Centre	202 Coronation Rd, Maitland
Current Land Use Zone	GR5	MU2	MU2	MU3	GR4
Preferred Land Use Zone	MU3	MU3	MU3	GB7	GB4
Current Parking Zone	0	0	0	0	0
Preferred Parking Zone	PT3*	PT3*	PT3*	PT4*	PT3*
Construction Duration without Concession	18	18	18	24	18
Construction Duration with Concession	24	24	24	30	24
% Residential without Concession	100%	60%	80%	80%	100%
% Residential with Concession	70%	60%	80%	80%	80%
% Office Without Concession	0%	30%	5%	5%	0%
% Office with Concession	20%	30%	5%	5%	5%
% Retail Without Concession	0%	10%	15%	15%	0%
% Retail with Concession	10%	10%	15%	15%	5%
% Low-income Units with Concession	10%				
% Medium Income Units with Concession	10%				
Low-income Units Rent Discount Factor	80%				
Medium Income Units Rent Discount Factor	50%				
Open Market Units Rent Discount Factor with Concessions	10%				
0bed:1bed:2bed:3bed (Ratio)	2:3:4:1				
0bed; 1bed; 2bed; 3bed (Size)	30m2; 44m2; 60m2; 72m2				
Parking Bay Size (including manoeuvre room)	30m2				
% Open Market Residential Units Sold without Concessions	70%				
% Open Market Residential Units Sold with Concessions	55%				
% Residential Occupancy Rate Without Concessions	80%				
Building Maintenance Cost Per m2	R22/m2 (2011); R35/m2 (2018)				
Construction Cost Residential per m2	R9000/m2 (2011); R13400/m2 (2018)				
Construction Cost Office per m2	R8700/m2 (2011); R12950/m2 (2018)				
Construction Cost Retail per m2	R6000/m2 (2011); R9350/m2 (2018)				
Construction Cost Parking per m2	R3750/m2 (2011); R5600/m2 (2018)				
Interest Rate on Loan	10.25%				

Table 10 - Case Study Configuration

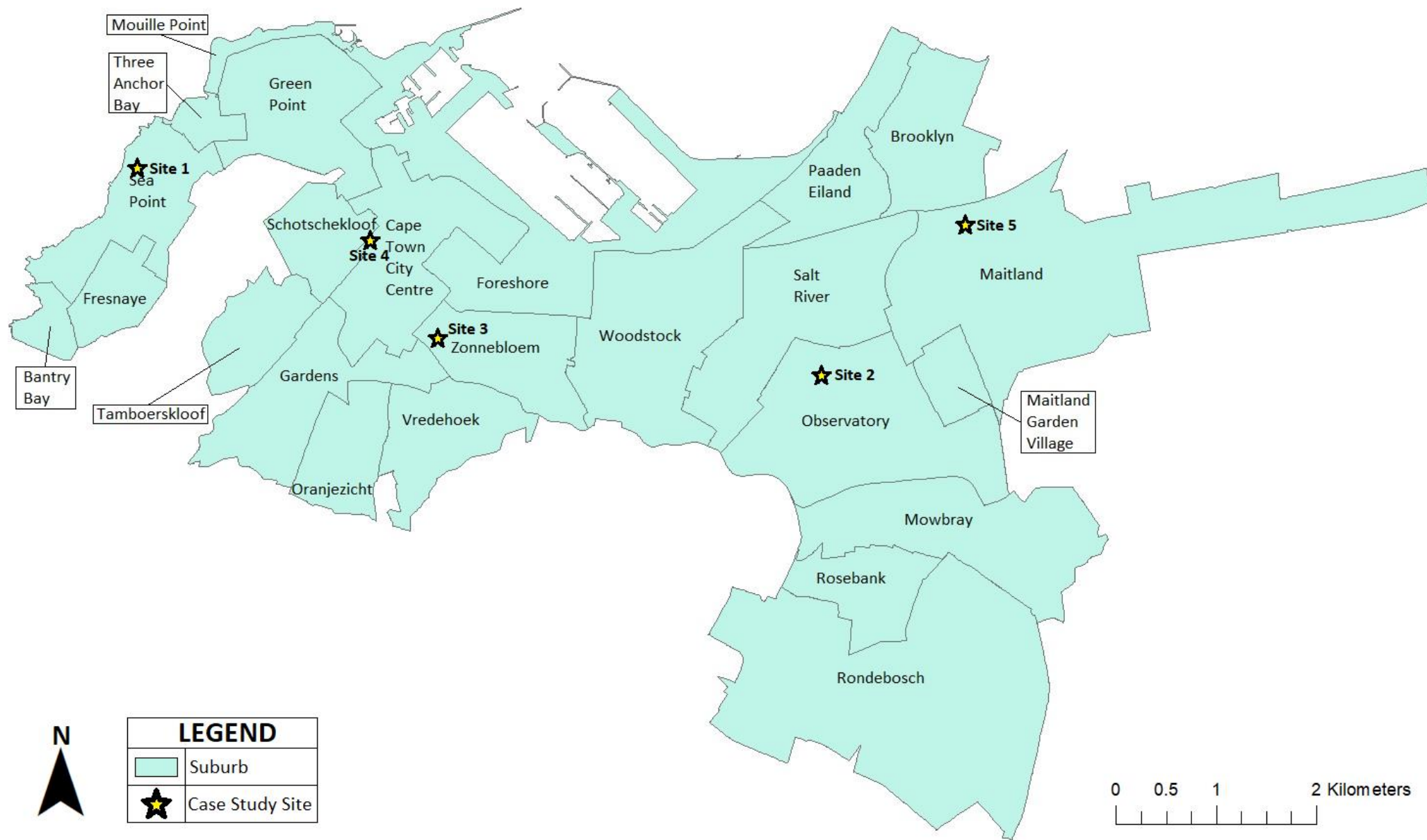


Figure 16 - Case Study Sites Map

Suburb	Sea Point			Observatory			Zonnebloem			City Centre			Maitland		
Properties for Sale															
Property	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Asking Price	R2 699 100	R5 454 900	R3 555 000	R2 205 000	R1 930 500	R2 549 849	R2 025 000	R1 485 000	R1 440 000	R2 106 000	R1 696 500	R1 980 000	R503 991	R683 991	R593 991
Floor Area (m2)	47	87	67	57	64	62	50	45	41	36	30	35	36	49	42
Price per m2	R57 427.66	R62 700.00	R53 059.70	R38 684.21	R30 164.06	R41 126.60	R40 500.00	R33 000.00	R35 121.95	R58 500.00	R56 550.00	R56 571.43	R13 999.75	R13 959.00	R14 142.64
Suburb Ave Selling Price (Rand/m2)	R57 729			R36 658			R36 207			R57 207			R14 034		
Rental Properties															
Property	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Monthly Rent	R19 500	R18 500	R18 000	R8 500	R12 500	R7 500	R11 500	R8 600	R8 200	R15 000	R14 500	R12 500	R6 600	R7 500	R7 700
Floor Area (m2)	112	95	94	45	55	35	59	47	38	65	68	50	55	56	55
Price per m2	R174.11	R194.74	R191.49	R188.89	R227.27	R214.29	R194.92	R182.98	R215.79	R230.77	R213.24	R250.00	R120.00	R133.93	R140.00
Suburb Ave Rent (Rand/m2)	R187			R210			R198			R231			R131		
Vacant Land															
2011	R10 754			R2 506			R2 506			R4 991			R841		
2018 Inflation Adjust	R17 269			R4 024			R4 024			R8 014			R1 350		
Property	1	2	3	1	2	-	1	-	-	1	-	-	-	-	-
Comment							Woodstock used as proxy			Bo Kaap used as proxy			Scaled from Woodstock		
Asking Price	R35 000 000	R7 995 000	R7 995 000	R3 095 000	R4 400 000		R1 299 995			R13 000 000					
Plot Size (m2)	R1 738	R303	R372	R412	R593		R187			R683					
Price per m2	R20 138	R26 386	R21 492	R7 512	R7 420		R6 952			R19 034			R2 333		
Suburb Ave Land (Rand/m2)	R22 672			R7 466			R6 952			R19 034			R2 333		

Table 11 - 2018 Suburb Data

3.8 Summary and Conclusion

In this chapter, the research method was discussed. Section 3.1 presented the research methodology, while section 3.2 presented the aims of the literature review, namely, to establish whether inclusionary housing is considered in national or regional policies or legislation; whether formal attempts have been made by public authorities to introduce inclusionary housing requirements, and what challenges may have obstructed these processes; whether GIS tools have been used in the context of affordable or inclusionary housing, and what factors were considered in establishing site suitability for such projects. Based on findings of the literature reviewed, it was concluded that a GIS based planning support system for inclusionary housing profitability optimisation could be beneficial in the South African context, as it was confirmed that there is a desire by public authorities at national and regional levels to introduce inclusionary housing policies. It was found that a key challenge holding back the finalisation of inclusionary housing policies has been an inability to establish mechanisms through which the local conditions pertaining to specific sites could be taken into consideration by such policies. In addition, various studies were identified in which GIS systems had been developed, which intended to establish methods through which sites suitable for affordable housing, in terms of accessibility, could be identified. In the paper by Biermann & Van Ryneveld (2007), a GIS PSS which considered the financial implications of location on affordable housing projects, was discussed. While the system only considered four specific styles of residential development, it confirmed that the technical possibility exists to develop a more elaborate system, capable of considering a far wider range of customised developments required in the context of inclusionary housing.

In section 3.3 the proposed research intervention was presented; a GIS based inclusionary housing PSS with the capability of being used as a tool through which inclusionary housing policy can be developed, as well as to be used on a case by case basis in applying this policy.

Section 3.4 covered the initial stakeholder engagement process, in which factors relevant to the calculation of inclusionary housing viability were established, by first presenting a list of initial factors, and then revising this list upon review with the stakeholders.

In section 3.5, with the final list of factors, sources of data were presented, and a study area defined. It was confirmed that City of Cape Town maintains spatial data, which is publicly accessible via its Open Data Portal (CoCT, 2018); given that central locations are the context in which inclusionary housing is most beneficial to low-income communities, it was decided that central suburbs of Cape Town, less than 10km from the city centre would define the study area. Sources of market data for each of the precincts within the study area were identified, along with sources of data for non-spatial factors, including construction costs. In addition, by-laws governing land use rights and parking requirements were identified, along with municipal taxes.

Section 3.6 presented the process of developing the PSS. Sites within the study were identified around which the mathematical model was built in Excel. This model allows up to five land parcels to be compared simultaneously, for both 'business as usual' and 'inclusionary housing with concessions' scenarios. Under the former scenario, the scale of development on each site was maximised according to the land use zoning, while floor area was distributed amongst the permitted land uses according to stakeholder configuration and parking zone requirements. Under the latter scenario, the scale of development was maximised according to the land use zoning preferred by the stakeholders, while floor area was distributed amongst the permitted land uses, including a percentage of low and medium income residential space, defined according to stakeholder preferences, along with floor area allocated to parking according to parking zone requirements preferred by stakeholders. Once this model was complete, it was re-developed in Python, so that the process of reading GIS data could be

automated through ArcGIS's 'Search Cursor' function. The final Python PSS comprises nine modules, each of which was explained in detail.

Finally, in section 3.7, with stakeholder input, case study sites were identified on which to run the PSS, using 2011 market data, and 2018 market data (which was collected manually). The findings of the case study runs are presented in section 4.3, and analysis of these findings is presented in chapter 5.

4 Findings

In this chapter, the core findings of this research are presented across three sub-sections. Sub-section 4.1 presents findings in terms of stakeholders' desire for a GIS based inclusionary housing PSS. Sub-section 4.2 presents findings in terms of the availability of data and technical ability of this data to be utilised in the manner envisaged by the proposed research intervention. Finally, sub-section 4.3 presents the GIS PSS case study findings.

4.1 Stakeholder Perspectives

Through the course of conducting this research, literature published by stakeholders was reviewed, and stakeholder engagements, in the form of email correspondence and face to face meetings, took place. The aims were to establish which factors are considered essential in calculating the financial viability of an inclusionary housing development, and to establish whether there is a need for a GIS based inclusionary housing PSS.

4.1.1 Inclusionary Housing Financial Viability Factors

For the final list of factors considered by the PSS in calculating inclusionary housing project financial viability – determined through consultation with stakeholders as discussed in section 3.4 – please refer to Table 2 in that section.

4.1.2 Public Authorities

It was found that public authorities at both national and local level are grappling with a common challenge: difficulty in ensuring sufficient flexibility in inclusionary housing policy, to take into consideration factors influencing the viability of projects at a precinct level.

Through review of the Framework for an Inclusionary Housing Policy in South Africa (NDoH, 2007) (refer to section 2.1.7), it was found that there is concern over the possibility of ensuring a unified approach to inclusionary housing policy development across municipalities. An imbalance in project financial viability between metropolitan areas could result in conflict with the spatial development goals of national government, by potentially discouraging private sector investment in certain municipalities and precincts. NDoH (2007) therefore argued that a national inclusionary housing policy was needed to guide those of municipalities, who were acknowledged to be in a position best suited to tailoring their own inclusionary housing policies according to their local conditions (but within constraints specified by national government).

With the process of developing a national inclusionary housing policy having stalled for several years, City of Cape Town has begun drafting its own policy. Through engagement with City of Cape Town planning officials, it was confirmed that there is a need for a planning support system, both for policy development and implementation. In addition, it was communicated that the intention exists to have such a system developed, but a lack of resources had meant that this had not yet commenced (see section 5.1.4 for more details).

4.1.3 Private Sector Property Developers

Private sector property developers will only invest in projects that are financially viable. Key measures of financial viability were established to be generated equity (value of completed construction after all costs are deducted), and rental yield (annual rental income minus annual expenses, divided by generated equity).

One of the property developers consulted in Cape Town, referred to as Developer A in this study, recently launched an inclusionary housing development project. It was found that the decreased profit from affordable units is intended to be off-set by concessions granted by the city, in terms of permitted

floor area and parking requirements (see section 5.1.2 for more details on this engagement and this project). A key challenge experienced by the developer has been delay due to hesitance by case officers in approving use rights concessions, who fear legal challenge of their decisions, in an environment lacking inclusionary housing policy, or formal process through which to evaluate whether the desired concession is fair. This developer indicated that a GIS based inclusionary housing PSS may be beneficial, if able to aid case officers in making decisions based on data.

International Housing Solutions, an affordable housing investment company was also consulted. Their current business model is reliant on affordable land closer to the periphery of the city (but in close proximity to major transport links and employment opportunities – see section 5.1.1 for more details on this engagement). It was concluded that there was little desire to deviate from that model, and therefore the PSS would unlikely be beneficial.

4.2 Data Availability and System Design

As discussed in section 3.5 it was established that sufficient, and well-maintained data is available for the factors identified relevant in the context of an inclusionary housing development (discussed in section 3.4). Therefore, the process of developing the PSS could commence.

It was found that through ArcGIS's Search Cursor ArcPy function, it was possible to read shape file data tables. The datasets obtained were therefore converted through a process discussed in section 3.6.3.1 to a format compatible with the Search Cursor function. The mathematical model for the PSS was first developed in Excel (see section 1.1.1) and then redeveloped in Python (see section 3.6.3.2) to enable the system to interface with the Search Cursor function.

In summary, the final system is capable of:

- comparing up to five land parcels per run
- calculating two scenarios per run per site
 - Business as usual (maximising scale of construction allowed under existing land use and parking zoning applicable to land parcel)
 - Inclusionary housing with concessions (maximising scale of construction allowed under stakeholder defined land use and parking zoning, in exchange for a stakeholder defined percentage of affordable housing)
- establishing the size of the chosen parcels, current land use and parking zoning, and suburb
- allowing stakeholders to define the configuration of construction
 - land use split for both scenarios per site (within zoning restrictions)
 - proportion and size of 0/1/2/3-bedroom units within residential component of development
 - percentage of low and medium income units (inclusionary housing scenario)
- allowing definition of discount factors for low, medium and open market (as described in section 1.1.1)
- allowing definition of construction duration estimate (in months) for both scenarios per site
- allowing definition of anticipated number of open market residential units sold and occupancy rates per scenario
- allowing definition of construction costs and building maintenance costs, per m²
- allowing definition of interest rate on loan to fund project
- assigning market data for vacant land, completed construction, rental income, municipal evaluation, per m² per suburb, to each parcel

- calculating the maximum floor area permitted per land use per site according to stakeholder configurations
- calculation of net cost of project on each site for both scenarios (construction, land, sold residential units)
- calculation of net monthly income of completed construction for each site for both scenarios
- calculate the financial viability of the projects on each site for both scenarios (generated equity and rental yield)

4.3 Case Study Findings

As discussed in section 3.7, once the Python based system had been developed, meetings were held with stakeholders in which the system was presented and discussed, and in which case study sites were identified on which they would consider pursuing projects, so that the system could be run in the context of more realistic scenarios, so that it could be evaluated with a greater degree of confidence. Five sites were configured with stakeholder input, along with reference to the configurations adopted on recent projects within the study area (see section 3.5.6).

The suburb market data obtained (discussed in section 3.5.2) was several years out of date (2011). In the interest of yielding outputs of greater relevance to stakeholders, more recent data was pursued. A lack of research funding meant that this could not be procured from private sector property analysis consultancies, therefore, data was manually collected for 2018 through systematic review of real estate agents' advertisements (as discussed in section 3.7).

The PSS was run on the five sites using both the 2011 and 2018 suburb market datasets, and for one additional run using 2018 market data, but with a slightly different construction configuration, to determine whether it was possible to improve the rental yield outcome. The results of these runs are presented in Figure 17 through Figure 19. Note that in order to fit the tables onto a single page, they have been split, and stacked vertically (i.e.: the output table comprises 6 rows and 36 columns). As an example, under 2018 Market Data conditions, site C01600070002615500000000000 is a parcel of 5976m² and is located in Observatory (Cape Town suburb). The zone under the business as usual scenario (No conc) is MU2, and under the inclusionary housing with concessions scenario (With conc) is MU3. The rental yield estimated under business as usual conditions is 6.8%, while under inclusionary housing with concessions is 8.7%.

Parcel #	Parcel Size	Suburb	Zone (No Conc)	Zone (With Conc)	Parking Zone (No Conc)	Parking Zone (With Conc)	Floor Area Total (No Conc)	Floor Area Total (With Conc)	Floor Area Resi Open (No Conc)	Floor Area Resi Open (With Conc)	Floor Area Resi Low (No Conc)	Floor Area Resi Low (With Conc)	Floor Area Resi Med (No Conc)	Floor Area Resi Med (With Conc)	Floor Area Office (No Conc)	Floor Area Office (With Conc)	Floor Area Retail (No Conc)	Floor Area Retail (With Conc)	Floor Area Parking (No Conc)	Floor Area Parking (With Conc)
C0160052000005510000000000	351	SEA_POINT	GR5	MU3	0	PT3	877.5	2106	298	806.4	N/A	100.8	N/A	100.8	0.0	343.8	0.0	171.9	360.0	566.0
C0160007000261550000000000	5976	OBSERVATORY	MU2	MU3	0	PT3	23904	35856	6346	11848	N/A	1481	N/A	1481	3259.6	8781.1	1086.5	2927.0	12775.4	9249.3
C0160007000056670000000000	2727	ZONNEBLOEM	MU2	MU3	0	PT3	10908	16362	3826	7092.8	N/A	886.6	N/A	886.6	247.9	667.8	743.7	2003.5	5750.0	4561.1
C0160007001487910000000000	3348	CAPE_TOWN_CITY_CENTRE	MU3	GB7	0	PT4	20088	40176	7250	25640	N/A	3205	N/A	3205	456.5	2008.8	1369.6	6026.4	10831.4	0.0
C0160007001731790000000000	1602	MAITLAND	GR4	GB4	0	PT3	2403	4806	1008	2064	N/A	258	N/A	258	0.0	196.2	0.0	588.5	1200.0	1324.0

Land Cost	Construction Cost (No Conc)	Construction Cost (With Conc)	Construction Duration (No Conc)	Construction Duration (With Conc)	Monthly Profit (No Conc)	Monthly Profit (With Conc)	Income at Completion (No Conc)	Income at Completion (With Conc)	Debt at Completion (No Conc)	Debt at Completion (With Conc)	Equity at Completion (No Conc)	Equity at Completion (With Conc)	Yield (No Conc)	Yield (With Conc)
R 7 957 872.00	R 6 009 200.00	R 22 737 173.88	18	24	R 8 482.41	R 97 395.20	R 13 302 269.40	R 30 413 211.84	R 2 975 488.57	R 7 232 938.58	R 2 725 484.03	R 42 268 695.94	3.7%	2.8%
R 44 616 816.00	R 208 950 232.73	R 391 332 566.53	18	24	R 907 014.57	R 2 708 425.61	R 189 302 167.60	R 292 386 590.10	R 106 214 533.95	R 242 286 532.59	R 160 314 390.45	R 372 974 888.55	6.8%	8.7%
R 18 958 104.00	R 93 632 469.09	R 171 727 603.27	18	24	R 385 309.64	R 964 724.53	R 112 929 587.40	R 173 057 574.69	R 18 287 757.09	R 60 810 224.28	R 71 964 633.51	R 155 559 526.87	6.4%	7.4%
R 63 725 832.00	R 176 524 305.46	R 511 830 800.00	24	30	R 384 619.44	R 2 956 323.14	R 320 565 525.00	R 907 574 753.25	-R 25 909 089.26	-R 164 720 831.43	R 278 721 788.44	R 1 228 577 099.70	1.7%	2.9%
R 3 737 466.00	R 20 227 200.00	R 50 029 356.73	18	24	R 61 816.35	R 175 969.27	R 14 102 390.40	R 22 025 133.90	R 13 826 944.60	R 43 917 556.15	-R 7 783 063.00	-R 16 663 667.08	-9.5%	-12.7%

Figure 17 - Application of Model (2018 Market Data)

Parcel #	Parcel Size	Suburb	Zone (No Conc)	Zone (With Conc)	Parking Zone (No Conc)	Parking Zone (With Conc)	Floor Area Total (No Conc)	Floor Area Total (With Conc)	Floor Area Resi Open (No Conc)	Floor Area Resi Open (With Conc)	Floor Area Resi Low (No Conc)	Floor Area Resi Low (With Conc)	Floor Area Resi Med (No Conc)	Floor Area Resi Med (With Conc)	Floor Area Office (No Conc)	Floor Area Office (With Conc)	Floor Area Retail (No Conc)	Floor Area Retail (With Conc)	Floor Area Parking (No Conc)	Floor Area Parking (With Conc)
C0160052000005510000000000	351	SEA_POINT	GR5	MU3	0	PT3	877.5	2106	298	593.6	N/A	74.2	N/A	74.2	0.0	343.8	0.0	343.8	360.0	492.2

Land Cost	Construction Cost (No Conc)	Construction Cost (With Conc)	Construction Duration (No Conc)	Construction Duration (With Conc)	Monthly Profit (No Conc)	Monthly Profit (With Conc)	Income at Completion (No Conc)	Income at Completion (With Conc)	Debt at Completion (No Conc)	Debt at Completion (With Conc)	Equity at Completion (No Conc)	Equity at Completion (With Conc)	Yield (No Conc)	Yield (With Conc)
R 7 957 872.00	R 6 009 200.00	R 20 366 827.76	18	24	R 8 482.41	R 99 898.03	R 13 302 269.40	R 22 409 846.91	R 2 975 488.57	R 12 329 176.18	R 2 725 484.03	R 41 352 855.76	3.7%	2.9%

Figure 18 - Application of Model (2018 Market Data - Re-Run Site 1 and 5)

	Parcel #	Parcel Size	Suburb	Zone (No Conc)	Zone (With Conc)	Parking Zone (No Conc)	Parking Zone (With Conc)	Floor Area Total (No Conc)	Floor Area Total (With Conc)	Floor Area Resi Open (No Conc)	Floor Area Resi Open (With Conc)	Floor Area Resi Low (No Conc)	Floor Area Resi Low (With Conc)	Floor Area Resi Med (No Conc)	Floor Area Resi Med (With Conc)	Floor Area Office (No Conc)	Floor Area Office (With Conc)	Floor Area Retail (No Conc)	Floor Area Retail (With Conc)	Floor Area Parking (No Conc)	Floor Area Parking (With Conc)		
	C0160052000005510000000000	351	SEA_POINT	GR5	MU3	0	PT3	877.5	2106	298	806.4	N/A	100.8	N/A	100.8	0.0	343.8	0.0	171.9	360.0	566.0		
	C01600070002615500000000000	5976	OBSERVATORY	MU2	MU3	0	PT3	23904	35856	6346	11848	N/A	1481	N/A	1481	3259.6	8781.1	1086.5	2927.0	12775.4	9249.3		
	C01600070000566700000000000	2727	ZONNEBLOEM	MU2	MU3	0	PT3	10908	16362	3826	7092.8	N/A	886.6	N/A	886.6	247.9	667.8	743.7	2003.5	5750.0	4561.1		
	C01600070014879100000000000	3348	CAPE_TOWN_CITY_CENTRE	MU3	GB7	0	PT4	20088	40176	7250	25640	N/A	3205	N/A	3205	456.5	2008.8	1369.6	6026.4	10831.4	0.0		
	C01600070017317900000000000	1602	MAITLAND	GR4	GB4	0	PT3	2403	4806	1008	2064	N/A	258	N/A	258	0.0	196.2	0.0	588.5	1200.0	1324.0		
Land Cost	Construction Cost (No Conc)	Construction Cost (With Conc)	Construction Duration (No Conc)	Construction Duration (With Conc)	Monthly Profit (No Conc)	Monthly Profit (With Conc)	Income at Completion (No Conc)	Income at Completion (With Conc)	Debt at Completion (No Conc)	Debt at Completion (With Conc)	Equity at Completion (No Conc)	Equity at Completion (With Conc)	Yield (No Conc)	Yield (With Conc)									
R 3 774 654.00	R 4 032 000.00	R 15 217 558.16	18	24	R 6 897.05	R 64 163.63	R 4 465 076.00	R 9 801 633.60	R 4 633 096.07	R 13 491 495.81	-R 2 719 492.07	R 2 292 429.26	-3.0%	33.6%									
R 14 975 856.00	R 139 899 927.27	R 261 932 298.98	18	24	R 223 906.13	R 685 195.54	R 52 697 974.00	R 74 446 861.50	R 127 800 165.85	R 265 169 052.31	-R 53 539 218.03	-R 113 729 470.17	-5.0%	-7.2%									
R 6 833 862.00	R 62 615 536.36	R 114 729 189.80	18	24	R 154 321.62	R 287 775.37	R 35 860 349.00	R 51 260 155.65	R 45 078 626.44	R 97 831 686.46	-R 16 407 103.62	-R 34 510 685.00	-11.3%	-10.0%									
R 16 709 868.00	R 118 057 581.82	R 342 084 960.00	24	30	R 182 672.54	R 1 373 881.22	R 95 584 300.00	R 240 192 315.00	R 69 702 167.01	R 222 893 557.51	R 5 704 322.09	R 58 659 117.89	38.4%	28.1%									
R 1 347 282.00	R 13 572 000.00	R 33 422 735.20	18	24	R 39 495.59	R 45 441.95	R 4 350 360.00	R 5 685 322.50	R 13 037 139.79	R 36 958 604.57	-R 11 172 699.79	-R 30 174 803.82	-4.2%	-1.8%									

Figure 19 - Application of Model (2011 Market Data)

4.4 Summary and Conclusion

This chapter presented the core findings of this research. Sub-section 4.1 presented the finding that alignment exists between stakeholder interests and the potential value offered by a GIS based inclusionary housing PSS. Section 4.2 presented the findings that data availability was confirmed for the study area defined in section 3.5.1, and that it had been found to be possible to develop a PSS capable of utilising this data to achieve the desired outcome; namely, to calculate the financial viability of an inclusionary housing development project, and compare it with that of a 'business as usual' development project. In section 4.3, the findings of the final Python based PSS case study assessment were presented. The case study considered five sites within the study area on which stakeholders would consider pursuing inclusionary housing projects. Each site had been configured for both the 'business as usual' and 'inclusionary housing with concessions' scenarios (see section 3.7 for more details), and the system run using 2011 and 2018 suburb market data, to generate the output reports presented. In chapter 5, these output reports are evaluated.

5 Discussion

In this chapter, the findings of this research are discussed. Section 5.1 presents the key points raised during consultative meetings with stakeholder groups, which took place upon completion of the development phase of the PSS. Section 5.2 discusses the findings of the case study outputs first on an individual site basis, and then comparatively; so that patterns across sites and scenarios, as well as shortcoming with the system, can be identified

5.1 Stakeholder Engagement

As discussed in section 3.7, upon completion of the development phase of the PSS, meetings were held with stakeholders in which the system was presented, and feedback recorded. The main points raised during these sessions are presented here.

5.1.1 International Housing Solutions

International Housing Solutions is a private sector property investment company focused primarily on the construction of affordable housing.

Concern 1: A key indicator of project viability, rental yield, has been overlooked in selecting calculations to be performed by the PSS. Rental yield is a widely relied upon decision making indicator used by private sector developers/investors, determining whether a project will be adequately profitably. Rental yield is defined as the net annual profit (annual rental income minus annual expenses), divided by generated equity (total value of the project after cost of construction and interest is deducted). Housing projects will typically only be pursued where rental yield is greater than 9.5%

Response 1: After this meeting, the recommended rental yield calculation was added to the PSS, and included in the csv output table generated with each run of the system (and thus was included in the case study assessments).

Concern 2: The business model of International Housing Solutions relies on affordable land located near job opportunities, transport corridors and other amenities, which results in more peripheral locations. Constructions never exceed four stories (to ensure elevators, which add significant cost, are not required, and sufficient parking is supplied without using structured parking). It is therefore uncertain whether an inclusionary housing development, with mixed income groups, on more central, and therefore more expensive land, is a style of project International Housing Solutions would consider pursuing as there is doubt whether the targeted returns on investment can be achieved. In addition, there is concern that open market investors/tenants may not be in favour of cross subsidising lower income tenants.

Response 2: It is proposed that to bring low-income communities closer to a wider range of opportunities, it would be advantageous if International Housing Solutions were to consider pursuing an inclusionary housing development on more central land. It is possible that the effect of cross-subsidisation offered by bringing open market individuals into the model, and the granting of concessions, could result in rental yields exceeding 9.5%. This could be established by employing the PSS. Since it is intended that some of the benefit gained through granted concessions be used to leverage a slightly lower cost to open market investors and tenants, this could help overcome reluctance on their part to become stakeholders in an inclusionary housing development

5.1.2 Developer A

Developer A is a property development company that has focused primarily on luxury apartment redevelopments and new builds in central, affluent neighbourhoods of Cape Town. More recently they

have embarked on a project which deviates from their typical model; despite the absence of an inclusionary housing policy, a decision was made to add an inclusionary housing component. The model proposes to obtain 20% additional development rights to provide inclusionary housing based on a “1 for 1” approach; for every 1 additional square meter granted, the developer will match it with 1 square meter of inclusionary housing.

Concern 1: The city is no longer allowing floor area departures; property developers must submit site rezoning applications should greater floor area be desired, and the site is not already at its highest subzone. Therefore, the PSS would need to allow assessment of a site that is rezoned

Response 1: The PSS was developed on the assumption that concessions will be in the form of rezoning, and therefore already fulfils this requirement

Concern 2: Planning delays have considerable impact on project viability (costs escalate due to inflation and interest incurred on loans). With land use departure applications, planning authorities currently lack a data driven approach in determining whether to grant permission. The ongoing decision-making process which often results in legal challenges, has made the City reluctant to make decisions. If the PSS can be used as evidence of a systematic approach having been followed in reaching a decision, this could be advantageous in decision making.

Response 2: The intention is for the PSS to aid decision making both during inclusionary housing policy development, and potentially as a policy implementation tool. Therefore, it has the potential to mitigate delay.

Concern 3: Property developers typically do not want to retain stock for rental, but it is uncertain how it can be ensured that affordable units remain affordable after they have been sold. It is possible that affordable housing NPOs or Social Housing Institutions (SHI) such as Communicare take ownership of these units and manage them as part of their rental stock portfolios.

Response 3: This mechanism through which affordable units are managed must be investigated further, however this falls outside of the scope of this research.

5.1.3 Transport and Urban Development Authority, City of Cape Town – Urban Development and Planning

To gauge whether any fundamentally flawed assumptions had been made in interpreting and integrating City of Cape Town GIS datasets into the PSS’s mathematical model, input was required from City of Cape Town’s Urban Development and Planning division of TDA.

Concern 1: Instead of identifying sites using parcel or erf numbers, it is recommended to use LIS or SG26 keys (since erf numbers are duplicated in the system, while the recommended keys are unique per site).

Response 1: The PSS data table and code were since updated to work off SG26 keys instead of erf numbers.

Concern 2: There is an overlay zone for the CBD which reduces requirements to zero parking bays and allows for floor area departures. GIS data does exist for this overlay zone, but it is not provided on the city’s Open Data Portal.

Response 2: Should the PSS be developed further for utilisation by City of Cape Town, data for this overlay zone will need to be obtained and integrated into the PSS.

Concern 3: Certain city owned land parcels have what is termed split zoning, where there are multiple zones assigned to the same parcel. In the Open Data Portal obtained data, this level of detail is not provided, but the city does have this data in a GIS database elsewhere. If the site has split zoning assigned, the system would need to search an alternative database to establish the various zones applicable to that site.

Response 3: Should the PSS be developed further for utilisation by City of Cape Town, data for split zoning will need to be obtained and integrated into the PSS.

5.1.4 Transport and Urban Development Authority, City of Cape Town – Housing

The Housing division within City of Cape Town's Urban Development and Planning division of TDA are in the process of developing a draft inclusionary housing policy. A Meeting was therefore scheduled with several officials from this department to present the system and better understand their needs.

Concern 1: It would be beneficial if the PSS allowed for alternative concession forms, such as floor area departures.

Response 1: The system could be developed further to permit different forms of concessions to be configured on a site, however time constraints prevent this from being completed prior to completion of this research.

Concern 2: Various land parcels across the city already have land use rights concessions or even restrictions, taking priority over the usual constraints of the parcel's current zoning. The PSS would need to be capable of taking this into consideration.

Response 2: Given access to the necessary datasets, the PSS can be developed further to take into consideration existing land use departures, however due to time constraints, this could not be completed prior to completion of this research.

Concern 3: In addition to on-site inclusionary housing, the City is considering the possibility to allow property developers the opportunity to rather build low-income units off-site (possibly on city owned land, so that the scale of delivery can be increased), or a fee in lieu option, where the developer pays a fee proportional to the additional profit earned as a result of concessions granted (the proceeds of which could be used by the city to fund the construction of affordable housing units on city owned land). Ideally the PSS should be capable of accommodating such scenarios.

Response 3: The current system is not able to accommodate these scenarios, however for the fee in lieu option, this fee could be linked to the generated equity, and the value of the affordable units. In terms of off-site units on city owned land, the simplest mechanism through which this scenario can be considered is to run the system on two different sites in parallel, assign one of the sites entirely to open market units, and the other entirely to low-income units, and allow for the cost of land to be manually adjusted to zero on the city owned parcel.

Concern 4: It is desired that affordable units be defined as a customisable percentage of open market units, rather than an independently defined figure, since the plan by the city is not to utilise national grants to fund affordable units.

Response 4: The PSS allows users to define affordable units as a percentage of open market values already.

Concern 5: Retaining affordable units as rental stock aligns with the approach preferred by the city.

Response 5: This is the assumption made by the PSS.

Concern 6: A user interface would be required to ensure case officers who may use the system on a day to day basis are able to do so with minimal training and risk of incorrectly configuring the system.

Response 6: This would be a relatively simple task, however development of a user interface fell outside of the scope of the research objective, since it would be of little academic value.

Concern 7: What has been lacking in the City's process of developing an inclusionary housing policy has been the ability to model the consequences of theoretically imposed requirements. Therefore, the PSS does respond to a need. The intention was to overcome this inadequacy through a PSS, but due to a lack of capacity within the department, no progress has been made.

Response 7: While there are areas that would require further expansion to meet the full scope of the city's needs in terms of consideration of additional factors and scenarios unique to the city's desired approach to inclusionary housing policy, given access to the necessary datasets, the system could be developed to fulfil this role.

The meeting was concluded with an agreement to schedule another meeting again once inclusionary housing policy details have been developed sufficiently, to the point where it is clear exactly what the PSS would need to accommodate, and potentially develop it further to meet these requirements.

5.2 Evaluation of Case Study Outputs

In this section, case study findings presented in section 4.3 are interpreted with the aid of stakeholder input. It should be noted that the PSS has not undergone sufficient refinement to be considered capable of yielding outputs that can be considered definitive. Nevertheless, patterns which emerge may be of relevance, and are therefore identified.

5.2.1 2018 Market Data

Refer to Figure 17 (section 4.3) for the 2018 market data output table. The results for each site are discussed in detail:

Site 1 (C0160052000005510000000000)

Site 1 is situated in Sea Point; a wealthy Atlantic Seaboard suburb. At 351 m², it was the smallest parcel considered in the assessment. The total floor area allowed under existing land use zoning is 877.5 m², while only residential use is permitted. It does not fall under any parking overlay zones, therefore parking requirements had to comply with "standard areas" in Table 6 in section 3.5.4.

Under the inclusionary housing scenario, the total floor area permitted increased to 2106 m², with residential, office and retail being permitted land uses under the chosen concessionary land use zone. In addition, parking requirements were relaxed to PT3 (see Table 6 in section 3.5.4). A total of 100.8 m² of floor area was allocated to low-income residential units, and a further 100.8 m² to medium income residential units.

The increased scale of development permitted resulted in a R39.5m increase in generated equity (value of portion of completed construction retained by developer, minus debt owed on loans to fund project). Of the five sites investigated with 2018 market data, site 1 was the only parcel on which a profitable development saw a decrease in rental yield (by 0.9%). This is due to the higher increase in generated equity in proportion to the increase in net monthly income.

In an attempt to improve the rental yield, an additional run was performed, in which the following configuration changes were made to the inclusionary housing scenario:

- Residential floor area was reduced to 60% of the development (previously 70%)

- Retail floor area was increase to 20% of the development (previously 10%)
- Low-income rent discount factor was reduced from 80% to 75%
- Medium income rent discount factor was reduced from 50% to 35%

The output table from this run is presented in Figure 18 (section 4.3). The configuration adjustments resulted in:

- A slightly lower increase in generated equity of R38.6m over the business as usual scenario (instead of R39.5m as seen with the initial 2018 run)
- A rental yield reduction of 0.8% (instead of 0.9% as seen with the initial 2018 run)

It is concluded that on this site, it may be difficult to achieve an improvement in rental yield under an inclusionary housing scenario, however it may be possible to substantially increase the generated equity.

Site 2 (C0160007000261550000000000)

Site 2 is situated in Observatory; a middle class “Southern Suburbs” precinct. At 5976 m², it was the largest parcel considered in the assessment. The total floor area allowed under existing land use zoning is 23904 m², with residential, office and retail being permitted land uses. It does not fall under any parking overlay zones, therefore parking requirements had to comply with “standard areas” in Table 6 in section 3.5.4.

Under the inclusionary housing scenario, the total floor area permitted increased to 35856 m². Parking requirements were relaxed to PT3 (see Table 6 in section 3.5.4). A total of 1481 m² of floor area was allocated to low-income residential units, and a further 1481 m² to medium income residential units.

The increased scale of development permitted under the inclusionary housing scenario resulted in a R212.7m increase in generated equity at completion, and an increase in rental yield from 6.8% to 8.7%. It is concluded that on this site, it may be possible to achieve both an increase in generated equity and rental yield under an inclusionary housing scenario.

Site 3 (C0160007000056670000000000)

Site 3 is situated in Zonnebloem; a middle class “City Bowl” suburb. The parcel size is 2727 m². The total floor area allowed under existing land use zoning is 10908 m², with residential, office and retail being permitted land uses. It does not fall under any parking overlay zones, and therefore parking requirements had to comply with “standard areas” in Table 6 in section 3.5.4.

Under the inclusionary housing scenario, the total floor area permitted increased to 16362 m². Parking requirements were relaxed to PT3 (see Table 6 in section 3.5.4). A total of 886.6 m² of floor area was allocated to low-income residential units, and a further 886.6 m² to medium income residential units.

The increased scale of development permitted under the inclusionary housing scenario resulted in a R83.6m increase in generated equity at completion, and an increase in rental yield from 6.4% to 7.4%. It is concluded that on this site, it may be possible to achieve both an increase in generated equity and rental yield under an inclusionary housing scenario.

Site 4 (C0160007001487910000000000)

Site 4 is situated in Cape Town City Centre; a wealthy precinct within the greater “City Bowl”. The parcel size is 3348 m². The total floor area of the development permitted under existing land use

zoning is 20088 m², with residential, office and retail being permitted land uses. According to the data obtained, parking requirements had to comply with “standard areas” in Table 6 in section 3.5.4.

Under the inclusionary housing scenario, the total floor area permitted increased to 40176 m². Parking requirements were relaxed to PT4 (see Table 6 in section 3.5.4). A total of 3205 m² of floor area was allocated to low-income residential units, and a further 3205 m² to medium income residential units.

The increased scale of development permitted under the inclusionary housing scenario resulted in a R949.9m increase in generated equity at completion, and an increase in rental yield from 1.7% to 2.9%. It is concluded that on this site, it may be possible to achieve both an increase in generated equity and rental yield under an inclusionary housing scenario.

Site 5 (C0160007001731790000000000)

Site 5 is situated in Maitland; a low-income “Near Eastern Suburbs” precinct. The parcel size is 1602 m². The total floor area of the development permitted under existing land use zoning is 2403 m², with only residential use being permitted. It does not fall under any parking overlay zones, and therefore parking requirements had to comply with “standard areas” in Table 6 in section 3.5.4.

Under the inclusionary housing scenario, the total floor area permitted increased to 4806 m². Parking requirements were relaxed to PT3 (see Table 6 in section 3.5.4). A total of 258 m² of floor area was allocated to low-income residential units, and a further 258 m² to medium income residential units.

Under the business as usual scenario, the project generated a substantial loss, possibly due to a construction standard (Prestige apartment block specification - as discussed in section 3.7) far too high to be absorbed by the market conditions in a low-income suburb. It was noted that under the inclusionary housing scenario, the loss generated increased by R8.8m, and the rental yield decreased from -9.5% to -12.7%. It therefore appears that in low-income areas, where the effect of cross-subsidisation is weaker, and the cost of large scale construction of a high standard cannot be absorbed by the market, inclusionary housing projects may not be as viable as in wealthier areas.

5.2.2 2011 Market Data

For the 2011 assessment, all configurations were carried over from the 2018 assessment, with only the market data differing. As discussed in section 3.7 (see Figure 15), the Cape Town property market was beginning to recover from a severe recession, resulting in a challenging environment for viable property development. The only sites to see positive “rental yields” with 2011 market data, under either development scenario, were sites 1 and 4. Both these sites are in more affluent neighbourhoods of Cape Town (Sea Point is an Atlantic Seaboard suburb, while Cape Town City Centre is in the City Bowl), and as can be seen in Figure 15 (section 3.7), have been slightly more resilient to the impact of the housing market recession. In addition, the effect of cross-subsidisation is naturally higher in more affluent suburbs.

Refer to Figure 19 (section 4.3) for the 2011 market data output table. The results for each site are discussed in detail:

Site 1 (C0160052000005510000000000)

Unlike the 2018 assessments, the ‘business as usual’ scenario using 2011 market data yielded a loss (i.e.: the cost of construction and debt due to interest to fund project exceeds the total value of the completed construction retained by the developer). Under the inclusionary housing scenario however, the project generated R2.3m in equity; substantially lower than the R42.3m seen under 2018 market conditions (even if inflation were to be considered). The rental yield increased to 33.6%, which is

exceptionally high, however caution is required in interpreting this figure, since it is more a consequence of deflated generated equity than high rental returns.

Site 2 (C0160007000261550000000000)

As with site 1, the 'business as usual' scenario yielded a loss. However, the inclusionary housing scenario on site 2 yielded an even greater loss. Consequently, rental yield is negative under both scenarios.

Site 3 (C01600070000566700000000000)

As with site 2, both the 'business as usual' and inclusionary housing scenarios yielded a loss. Consequently, rental yield is negative under both scenarios.

Site 4 (C01600070014879100000000000)

Site 4, in Cape Town City Centre, was the only parcel in the 2011 assessment which indicated potentially viable projects both under the 'business as usual' and inclusionary housing scenarios. The increased scale of development under the inclusionary housing scenario resulted in a R52.9m increase in generated equity at completion. While this is a substantial increase, it is still significantly lower than the 2018 increase of R949.9m (even if inflation is taken into account). Rental yield decreased under the inclusionary housing scenario by 10.3%, however at 28.1%, is still high (in relation to the 9.5% targeted minimum).

Site 5 (C01600070017317900000000000)

As with site 2 and 3, both the 'business as usual' and inclusionary housing scenarios yielded a loss. Consequently, rental yield is negative under both scenarios.

5.2.3 Comparative Evaluation of Outputs and Stakeholder Feedback

2018 market data yielded different results to that of 2011 market data; likely due to the Cape Town housing market having been in recession prior to 2011 – with significant recovery occurring in the years which followed (see Figure 15 in section 3.7). It is noted that under 2018 market conditions, all sites in affluent suburbs yielded profitable developments in terms of generated equity and rental yield, under both scenarios. It therefore appears that it is possible to improve the financial viability of a project meeting inclusionary housing requirements through the introduction of concessions. The viability of an inclusionary housing project appears to be reliant on sufficient balance between rental income and cost of land. In wealthy suburbs, such as Sea Point, increased land cost is not as well balanced by a proportional increase in rental income, as is seen in slightly less wealthy suburbs such as Zonnebloem and Observatory, where the inclusionary housing model appears to be more financially viable.

Based on the findings for the Maitland site, it appears that the inclusionary housing model is less likely to be financially viable in low-income areas. The advantage offered by cheaper land appears to be countered by weak cross-subsidisation. However, through evaluation of the findings, it was noted that the global manner in which the PSS calculated construction is fundamentally flawed. While construction costs per m² were presumed homogenous by the model, regardless of project scale or location, in reality these rates do vary with scale of development and standard of finish. AECOM's annual construction cost reports provide estimates for a wide range of scale of development and standards of finish; therefore, data exists for far more accurate assessment of construction costs, which could be linked with the average income of the suburb considered, and scale of each development (linked to land use zone). This would prevent over capitalisation of the estimated project

in terms of a suburbs ability to absorb the level of construction specification. Due to insufficient time, it was not possible to incorporate this functionality into the system prior to finalisation of this study, and the added complexity inherent in this approach would require careful calibration.

The reliability of the 2018 market data is questionable, given that the manner in which it was collected differed from the 2011 data considerably (having far less data points). Therefore, while the results indicate the scale of impact that concessions and inclusion of low-income units may have over the business as usual case, the accuracy of the output values is questionable.

Upon review of outputs for their chosen site, Developer A noted that the estimated land value was lower than what they would expect. Further discussion revealed that the homogenous approach to vacant land value (where only the size of the parcel and the suburb are considered), is too simplistic. A more robust approach would have considered land use zone; a proxy for the potential value offered by a parcel, and therefore, market value. Also, since the asking price of a land parcel may already be known, should the system be developed further, it should allow stakeholders to manually override the estimated value. Finally, it was also suggested that a holding period be added to the project timeline; taking into consideration the period during which the developer has purchased the land, but is unable to commence construction for various reasons. While all suggestions could easily be incorporated into the system, due to insufficient time, they could not be implemented prior to completing this study.

5.3 Summary and Conclusion

Section 5.1 presented the key points raised during consultative meetings, which were held with several stakeholder groups upon completion of the PSS development phase. While it was established that additional functionality was needed to meet certain stakeholder requirements, several stakeholder groups saw, in principal, potential for the system to aid decision making. Due to insufficient time, many of these requested changes could not be implemented prior to the case study assessment phase, which commenced immediately after these engagements (using input gathered from stakeholders in terms of site selection and configurations – as discussed in section 3.7).

In section 5.2, case study findings were discussed. To evaluate the impact that the ‘inclusionary housing with concessions’ scenario had over the ‘business as usual’ scenario, sub-sections 5.2.1 and 5.2.2 discussed the outputs for each site individually, under 2018 and 2011 market conditions respectively. Sub-section 5.2.3 then compared the outputs across sites with stakeholder input, to identify patterns, allow evaluation of system reliability, and identify system shortcomings. It appeared that moderately wealthy neighbourhoods offer the best suited environment to the inclusionary housing model, while very wealthy neighbourhoods appear to see the cost of land increasing at a higher rate than rental income, which in turn results in a weaker cross-subsidisation effect. It appeared that the inclusionary housing model may be not be successful in low-income areas, but it was not certain whether this was due to a weak cross-subsidisation effect, or symptomatic of a flaw identified with the way construction costs are calculated by the PSS. Another concern was that 2018 market data comprised few data points; casting doubt over the reliability of outputs. In addition, the way the PSS estimates land value was found to be too simplistic; it was argued that the land use zone should be considered, and that users should be able to over-ride estimates where specific land parcel values are already known. Finally, the ability to define a ‘holding period’ during which construction cannot commence, but costs have begun to be incurred by the developer, was proposed. It should be noted that while most of the proposed additional functions could be incorporated to the PSS with relative ease, they would add complexity to an already elaborate model, reducing transparency, and necessitating careful calibration.

6 Conclusion

The primary objectives of this research were to establish whether there is a need for, and whether it is technically feasible to develop, a GIS based inclusionary housing planning support system (PSS), that is capable of assisting public authorities estimate the scale of concessions required, to ensure inclusionary housing projects can be profitable, and thus attractive to private sector investors, in the context of urban South Africa. This is ultimately to ensure that gentrification induced displacement of low-income communities from central urban areas can be prevented, and new affordable housing opportunities for low-income communities currently living on the urban periphery, can be generated.

It was hypothesised that a GIS based PSS, capable of analysing factors on multiple land parcels, could aid decision-making, by allowing comparison of the impact that use rights concessions, in exchange for meeting inclusionary housing requirements, could have on the viability of potential projects on different sites.

It was desired that the PSS be sufficiently flexible to accommodate widely differing conditions across precincts, in a fair, consistent, and transparent manner, as well as be responsive to fluctuating market conditions.

In addition, it was desired that the PSS, be capable of functioning both as an instrument to guide inclusionary housing policy development, and as a platform through which public authority case officers could negotiate the terms of specific inclusionary housing developments with private sector investors; in terms of the scale of concession offered, and proportion of affordable housing floor area included (according to the definition of affordability agreed upon by stakeholders).

To ensure that no primary data would need to be collected for the system to function, existing sources of data were required. In addition, although development of a user interface was not within the scope of this research, it was desired that the tool balance the needs of end users, in terms of limiting the number of inputs required, against the need to consider a sufficiently wide range of factors, to yield results which are reliable.

In the sub-sections to follow, the outcomes of this research are reviewed, and conclusions drawn in terms of which research objectives were achieved and which were not. In addition, system shortcomings are identified, and recommendations made in terms of how this research can be taken forward.

6.1 Research Outcomes

In chapter 1, the research problem was introduced; first providing a broad historical overview of urban planning theory, before moving onto the South African context pre-democracy, where urban planning theory had been infiltrated by racial prejudice, and thus used to racially segregate urban South Africa. The context then shifts to the democratic era, in which a host of deeply entrenched economic and social challenges had been inherited; compounded by a legacy of severe spatial inequality. While the RDP housing programme delivered housing to the urban poor at an impressive scale (hundreds of thousands of homes per year across the country), reliance on cheap peripheral land to allow this scale, further entrenched spatial inequality. Through the application of neo-liberal development approaches (in which the regeneration of urban centres was seen as a mechanism through which foreign direct investment could be attracted, and thereby achieve broader economic growth), insufficient consideration of the need for socio-economic redistribution accelerated gentrification of the few central urban areas which had previously been affordable. With a growing middle class, urban traffic congestion increased dramatically, and hence more affordable central gentrifying neighbourhoods

have become increasingly attractive, raising property prices in these areas; consequently, low-income communities renting in these neighbourhoods are being displaced. It was in response to this problem that the research objectives were defined; aiming to design a PSS that could assist with the development and implementation of inclusionary housing policies that could halt and ideally even reverse this trend, by encouraging centrally located affordable housing to be leveraged off private sector developments.

In chapter 2, various sources of literature were identified and reviewed; firstly to establish the compatibility of inclusionary housing theory with South African policy documents, frameworks and legislation, and then to establish what GIS tools pertaining to affordable housing already exist, to determine the technical feasibility of developing the proposed PSS.

It was found that as early as 1996, the White Paper on National Transport Policy (NDoT, 1996) recognised the importance of bringing low-income communities closer to opportunities through the provision of central affordable housing. It called for densification and infilling, and argued against the RDP housing approach, due to its reinforcement of unsustainable development patterns in terms of the land-use transport interrelationship, and restricted access to opportunities from those locations. The CSIR Guidelines for Human Settlement Planning and Design (CSIR, 2000) symbolised an alignment of NDoH with NDoT; in recognition of the burden sprawl puts on the transport network, the guidelines encouraged high density, mixed use and compact urban development. The first reference to inclusionary housing contained in official documentation was found in Breaking New Ground (NDoH, 2004), a five-year plan aimed at establishing mechanisms through which more sustainable and equitable human settlement development approaches could be achieved. The Framework for an Inclusionary Housing Policy in South Africa (NDoH, 2007) provided an in-depth review of the opportunities and risks that the introduction of inclusionary housing policies and legislation could have in the South African context. While it was acknowledged that matching the RDP housing programme's scale of delivery through an inclusionary housing policy would not be possible, it was suggested that it could contribute to greater spatial equity, and therefore should be pursued. A key risk identified by the framework was that a failure of policy to consider local conditions could negatively impact project financial viability, thus discouraging private sector investment. It was therefore concluded that not only is there a desire to pursue inclusionary housing policy in South Africa, but there is a need for mechanisms to be developed which can enable such policy to be flexible enough to accommodate local conditions.

Several studies were reviewed in which GIS based tools had been developed to aid with the identification of suitable locations for affordable housing. While, none of these studies dealt specifically with inclusionary housing, each considered various factors which impact on the affordability of housing for low income communities, as well as investors, and therefore contain techniques which are certainly of relevance in the assessment of sites suited to inclusionary housing. A study of particular interest, given its South African context, considered the financial implications of a range of alternatives to the RDP approach, using higher density housing configurations on more central land, using a GIS based PSS. Ultimately it was concluded that none of these systems are capable of integrating all the factors of relevance in the context of an inclusionary housing development; such as the wide range of private sector driven development configurations. However, based on techniques they employed, it was determined that it should be technically possible to develop such a system.

Chapter 3 presented the research method. After completion of the literature review, stakeholders were identified and engaged so that factors relevant to the calculation of the financial viability of an inclusionary housing project could be established. With the final list of factors identified, sources of data and a study area were required, so that development of the PSS's mathematical model could

proceed. It was found that City of Cape Town offers public access to comprehensive spatial data, hence, the central suburbs of Cape Town became the chosen study area. In addition, several sources of suburb market data were identified for this study area. The mathematical model was first developed in Excel, before being re-developed and expanded in Python, so that it could interface with ArcGIS's "Search Cursor" function; allowing the process of reading GIS databases to be automated. The final Python based PSS was then presented to Stakeholders for review, and so that five case study sites within the study area could be identified. The PSS was then configured to run on these sites using market data for 2011 and 2018.

In chapter 4, the findings of this research were presented across three sub-sections. Section 4.1 presented the various perspectives of stakeholders, and whether they believed the PSS could in theory aid decision making. Section 4.2 presents the final specification of the PSS, as well as sources of data used. Finally, section 4.3 presented the findings of the case studies.

Chapter 5 discussed the findings of this research. In section 5.1, the main points raised during engagements (held after finalisation of the Python based PSS), with two private sector stakeholders involved with property development, and two departments within City of Cape Town, were discussed. It was concluded that while the PSS was not compatible with the business model of the one private sector stakeholder, the other private sector stakeholder did see value in the system, since they were experiencing difficulties in proceeding with their proposed inclusionary housing development in a central suburb of Cape Town. This was found to be largely due to an absence of an inclusionary housing policy to define what level of concession was fair, and consequently an environment in which any decisions made by the public authority was open to challenge by community stakeholders. From the perspective of City of Cape Town officials, the PSS has the potential to fulfil its needs in terms of aiding with the development of an inclusionary housing policy through a data driven approach, as well as potentially aid case officer's negotiate the scale of concession offered to private sector property developers, in exchange for the meeting of inclusionary housing requirements (thereby aligning with the needs of the private sector developer as mentioned above). However, several shortcomings were identified with the system which would first need to be addressed:

The PSS would need to

- take into consideration additional overlay zones (specifically that which is applicable to the Cape Town CBD)
- take into consideration split zoning (where applicable)
- allow alternative forms of concession to be introduced, such as floor area departures
- take into consideration existing land use rights concessions and restrictions
- allow alternative models, such as off-site affordable units or fee in lieu options
- have a user interface developed to allow case officers to operate it with ease, and ensure that it can be configured transparently

In section 5.2, the case study findings were discussed, in terms of:

- The financial implications that the 'inclusionary housing with concessions' scenario had over the 'business as usual' scenario
- Patterns identified across suburbs
- Differences in outputs from the two suburb market datasets (2011 and 2018)
- Inherent system flaws

The following emerged:

- Moderately wealthy neighbourhoods appeared most conducive to financially viable inclusionary housing developments
- Wealthy neighbourhoods appear to see the cost of land increasing at a higher rate than rental income, which in turn appears to result in a weaker cross-subsidisation effect
- In low-income areas the inclusionary housing model may be not be viable, however it was not certain whether this was due to a weak cross-subsidisation effect, or symptomatic of a flaw identified with the manner in which construction costs are calculated by the PSS (where the construction specification is defined globally, rather than varying according to the standard of finish local market conditions are able to absorb).
- 2018 market data comprised few data points; casting doubt over the reliability of outputs.
- The way the PSS estimates land value was found to be too simplistic; it was argued that the land use zone should be considered, and that users should be able to over-ride estimates where specific land parcel values are already known
- The ability to define a 'holding period' during which construction cannot commence, but costs have begun to be incurred by the developer, was proposed.

6.2 Concluding Remarks and Recommendations

Based on the outcomes of this study, it can be concluded that a GIS based inclusionary housing PSS does have the potential to address the needs of stakeholders from both the private and public sectors, in that enabling evaluation of the impact that various inclusionary housing scenarios have on the financial viability of projects, where calculations can be performed on the basis of local conditions, could enable decisions to be made more efficiently and confidently. Ultimately, this could have a positive impact on low-income communities already residing in central, but gentrifying, urban areas, as well as low-income communities currently living far from opportunities on the urban edge.

While existing GIS based systems are capable of evaluating sites in terms of their suitability for a range of affordable housing solutions, none were developed specifically to evaluate site suitability for inclusionary housing developments. As a result, many factors which are unique to the inclusionary housing application, such as those linked with wide ranging construction configurations, and which have significant impact on financial viability, are not considered. The PSS developed through the course of this research indicates that it is indeed possible to develop a system suited to the inclusionary housing application. It should be recognised that in its present form, the PSS does not adequately meet the needs of all stakeholders; additional functionality is required, and more comprehensive approaches need to be developed for land value and construction cost calculations. It was also established that in some municipalities, brownfield re-developments are liable for development contribution costs, proportional to the increased scale of development over existing structures (regardless of whether bulk infrastructure must be re-engineered). From a technical perspective, the mathematical model can certainly be expanded to accommodate these needs, and it appears the necessary datasets do exist. However, caution is required in that further complexity could reduce transparency, which in turn could reduce confidence in the system.

Going forward, given that there is a desire from City of Cape Town to utilise a PSS to aid in the development of its inclusionary housing policy, and potentially a tool to aid case officers negotiate the terms of inclusionary housing developments with private sector stakeholders, it is suggested that this PSS be developed further. It is recommended that stakeholder engagement be an integral component of that process, and that the range of stakeholders engaged be expanded upon, to include not only more private sector investment groups, but also representatives of communities who will be impacted

most by inclusionary housing policy, to reduce the potential for resistance to such projects, and ensure the needs of these stakeholders are accommodated as far as possible by the PSS. Also, additional focus should be placed on establishing project viability measures; a broader range of indicators would ensure the PSS can both be more effectively calibrated, and more easily interpreted by different stakeholder groups. In addition, a more comprehensive case study assessment is required, that considers far more sites, in order to better gauge the statistical significance of outputs, and allow further calibration. Such a study would benefit from a graphical user interface, that would allow adjustment of the various user defined inputs more efficiently and transparently. Generation of a hot spot map could also be beneficial as a visual aid in identifying which sites offer the best potential for viable projects.

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A. Appendix – Ethics Clearance

Application for Approval of Ethics in Research (EIR) Projects
Faculty of Engineering and the Built Environment, University of Cape Town

APPLICATION FORM

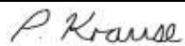
Please Note:

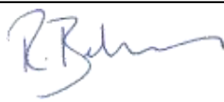

Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analysing data. The objective of submitting this application *prior* to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the **EBE Ethics in Research Handbook** (available from the UCT EBE, Research Ethics website) prior to completing this application form: <http://www.ebe.uct.ac.za/ebe/research/ethics1>

APPLICANT'S DETAILS		
Name of principal researcher, student or external applicant		Philip Gregory Krause
Department		Civil Engineering
Preferred email address of applicant:		pgkrause88@gmail.com
If Student	Your Degree: e.g., MSc, PhD, etc.	MSc Eng Transport Studies
	Credit Value of Research: e.g., 60/120/180/360 etc.	120
	Name of Supervisor (if supervised):	Prof. Roger Behrens and Prof. Mark Zuidgeest
If this is a research contract, indicate the source of funding/sponsorship		N/A
Project Title		A GIS Based Planning Support System for Inclusionary Housing Profitability Optimisation in Cape Town, South Africa

I hereby undertake to carry out my research in such a way that:

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

SIGNED BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	Philip Gregory Krause		17 March 2018

APPLICATION APPROVED BY	Full name	Signature	Date
Supervisor (where applicable)	Prof. Roger Behrens		19 Mar 2018
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all questions in Section 1; and for all Undergraduate research (Including Honours).			
Chair : Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the above questions.	A/Prof Adeniyi J Isafiade		11 April 2018

B. Appendix – PSS Code

Extract Multi Values to Points

```
def main():
    pass

if __name__ == '__main__':
    main()

import arcpy
from arcpy.sa import *
from datetime import datetime

arcpy.env.workspace = r'C:\Users\Philip\OneDrive\Masters - EM017\CIV5000Z\GIS\Trial_Database.gdb'

##Output location
inPointFeatures = r'C:\Users\Philip\OneDrive\Masters - EM017\CIV5000Z\GIS\Outputs\Land_Parcel_Clipped_Point_For_Zone_v1.shp'

##Input data
inRasterList = [{"Land_Parcel_Clipped_Raster_v2", "Parcel_Number"}, {"Zone_Parcels_Clipped_Raster_v1", "Land Use Zone"}, {"PT2_Clipped_Raster_v4", "PT2 Status"}, {"PT1_Clipped_Raster_v2", "PT1 Status"}, {"Suburbs_Clipped_Raster_v2", "Suburb"}]

print "Processing started - " + datetime.now().strftime("%H:%M:%S")

output = ExtractMultiValuesToPoints(inPointFeatures, inRasterList, "NONE")

print "Done processing - " + datetime.now().strftime("%H:%M:%S")
```

Module A – Site Configurations

```
def main():
    pass

if __name__ == '__main__':
    main()

#SITE SPECIFIC CONFIGURATION:

#Land Parcel Numbers

##Site_Number_1 = u'C0160007000953500000000000' #Enter land parcel number for 1st site to be assessed
##Site_Number_2 = u'C0160007001157500000000000' #Enter land parcel number for 2nd site to be assessed
##Site_Number_3 = u'C01600070000378900000000000' #Enter land parcel number for 3rd site to be assessed
##Site_Number_4 = u'C0160007001159290000000000' #Enter land parcel number for 4th site to be assessed
##Site_Number_5 = u'C0160007001416640000000000' #Enter land parcel number for 5th site to be assessed

Site_Number_1 = u'C0160052000005510000000000' #Blok Erf 551 (Sea Point)
#Site_Number_1 = u'C0160052000005500000000000' #Blok Erf 550 (Sea Point)
Site_Number_2 = u'C0160007000261550000000000' #Obs Court Observatory (FWJK)
#Site_Number_2 = u'C0160007000121260000000000' #New Market Street (City of Cape Town)
Site_Number_3 = u'C0160007000056670000000000' #Canterbury Street (City of Cape Town)
Site_Number_4 = u'C0160007001487910000000000' #100 Buitengracht
Site_Number_5 = u'C0160007001731790000000000' #202 Corronation Maitland

#City of Cape Town Sites
##Site_Number_1 = u'13614' #Pickwick Road Salt River
##Site_Number_2 = u'26155' #Obs Court Observatory
##Site_Number_3 = u'12126' #New Market Street
##Site_Number_4 = u'5667' #Canterbury Street
##Site_Number_5 = u'114825' #Upper Coventry Road

#Preferred Land Use Zone
Pref_LU_Zone_1 = 'MU3' #Enter preferred land use zone for 1st site to be assessed
Pref_LU_Zone_2 = 'MU3' #Enter preferred land use zone for 2nd site to be assessed
Pref_LU_Zone_3 = 'MU3' #Enter preferred land use zone for 3rd site to be assessed
Pref_LU_Zone_4 = 'GB7' #Enter preferred land use zone for 4th site to be assessed
Pref_LU_Zone_5 = 'GR4' #Enter preferred land use zone for 5th site to be assessed

#Preferred Parking Zone
Pref_Park_Zone_1 = 'PT3' #Enter preferred parking zone for 1st site to be assessed
Pref_Park_Zone_2 = 'PT3' #Enter preferred parking zone for 2nd site to be assessed
Pref_Park_Zone_3 = 'PT3' #Enter preferred parking zone for 3rd site to be assessed
Pref_Park_Zone_4 = 'PT4' #Enter preferred parking zone for 4th site to be assessed
Pref_Park_Zone_5 = 'PT4' #Enter preferred parking zone for 5th site to be assessed

#Construction Duration
Cnstrct_Dur_WO_Conc_1 = 18.0 #Construction duration in months for site 1 development without concessions
Cnstrct_Dur_W_Conc_1 = 24.0 #Construction duration in months for site 1 development with concessions
Cnstrct_Dur_WO_Conc_2 = 18.0 #Construction duration in months for site 2 development without concessions
Cnstrct_Dur_W_Conc_2 = 24.0 #Construction duration in months for site 2 development with concessions
Cnstrct_Dur_WO_Conc_3 = 18.0 #Construction duration in months for site 3 development without concessions
Cnstrct_Dur_W_Conc_3 = 24.0 #Construction duration in months for site 3 development with concessions
Cnstrct_Dur_WO_Conc_4 = 24.0 #Construction duration in months for site 4 development without concessions
Cnstrct_Dur_W_Conc_4 = 30.0 #Construction duration in months for site 4 development with concessions
Cnstrct_Dur_WO_Conc_5 = 18.0 #Construction duration in months for site 5 development without concessions
Cnstrct_Dur_W_Conc_5 = 24.0 #Construction duration in months for site 5 development with concessions

#Land Use Split Site 1 (total must equal 1)
Resi_WO_Conc_1 = 1.0 #Enter value for residential portion of Site 1 without concessions
Resi_W_Conc_1 = 0.6 #Enter value for residential portion of Site 1 with concessions
Office_WO_Conc_1 = 0.0 #Enter value for office portion of Site 1 without concessions
Office_W_Conc_1 = 0.2 #Enter value for office portion of Site 1 with concessions
Retail_WO_Conc_1 = 0.0 #Enter value for retail portion of Site 1 without concessions
```

Retail_W_Conc_1 = 0.2 #Enter value for retail portion of Site 1 with concessions

#Land Use Split Site 2 (total must equal 1)

Resi_WO_Conc_2 = 0.6 #Enter value for residential portion of Site 2 without concessions

Resi_W_Conc_2 = 0.6 #Enter value for residential portion of Site 2 with concessions

Office_WO_Conc_2 = 0.3 #Enter value for office portion of Site 2 without concessions

Office_W_Conc_2 = 0.3 #Enter value for office portion of Site 2 with concessions

Retail_WO_Conc_2 = 0.1 #Enter value for retail portion of Site 2 without concessions

Retail_W_Conc_2 = 0.1 #Enter value for retail portion of Site 2 with concessions

#Land Use Split Site 3 (total must equal 1)

Resi_WO_Conc_3 = 0.8 #Enter value for residential portion of Site 3 without concessions

Resi_W_Conc_3 = 0.8 #Enter value for residential portion of Site 3 with concessions

Office_WO_Conc_3 = 0.05 #Enter value for office portion of Site 3 without concessions

Office_W_Conc_3 = 0.05 #Enter value for office portion of Site 3 with concessions

Retail_WO_Conc_3 = 0.15 #Enter value for retail portion of Site 3 without concessions

Retail_W_Conc_3 = 0.15 #Enter value for retail portion of Site 3 with concessions

#Land Use Split Site 4 (total must equal 1)

Resi_WO_Conc_4 = 0.8 #Enter value for residential portion of Site 4 without concessions

Resi_W_Conc_4 = 0.8 #Enter value for residential portion of Site 4 with concessions

Office_WO_Conc_4 = 0.05 #Enter value for office portion of Site 4 without concessions

Office_W_Conc_4 = 0.05 #Enter value for office portion of Site 4 with concessions

Retail_WO_Conc_4 = 0.15 #Enter value for retail portion of Site 4 without concessions

Retail_W_Conc_4 = 0.15 #Enter value for retail portion of Site 4 with concessions

#Land Use Split Site 5 (total must equal 1)

Resi_WO_Conc_5 = 1.0 #Enter value for residential portion of Site 5 without concessions

Resi_W_Conc_5 = 0.8 #Enter value for residential portion of Site 5 with concessions

Office_WO_Conc_5 = 0.0 #Enter value for office portion of Site 5 without concessions

Office_W_Conc_5 = 0.05 #Enter value for office portion of Site 5 with concessions

Retail_WO_Conc_5 = 0.0 #Enter value for retail portion of Site 5 without concessions

Retail_W_Conc_5 = 0.15 #Enter value for retail portion of Site 5 with concessions

#UNIVERSAL CONFIGURATION:

#Universal Residential Split With Concessions (total must equal 1)

Resi_Open_W_Conc = 0.8 #proportion of all sites allocated to open market residential units with concessions

Resi_Low_W_Conc = 0.1 #proportion of all sites allocated to low income residential units with concessions

Resi_Med_W_Conc = 0.1 #proportion of all sites allocated to medium income residential units with concessions

#Universal Proportion of residential floor area allocated to various bedroom configurations (total must equal 1)

##Perc_0_Bed = 0.15 #proportion of residential floor area for all sites allocated to 0 bed units

##Perc_1_Bed = 0.35 #proportion of residential floor area for all sites allocated to 1 bed units

##Perc_2_Bed = 0.4 #proportion of residential floor area for all sites allocated to 2 bed units

##Perc_3_Bed = 0.10 #proportion of residential floor area for all sites allocated to 3 bed units

Perc_0_Bed = 0.2 #proportion of residential floor area for all sites allocated to 0 bed units

Perc_1_Bed = 0.3 #proportion of residential floor area for all sites allocated to 1 bed units

Perc_2_Bed = 0.4 #proportion of residential floor area for all sites allocated to 2 bed units

Perc_3_Bed = 0.1 #proportion of residential floor area for all sites allocated to 3 bed units

#Universal Size of unit for various bedroom configurations and parking

Size_0_Bed = 30.0 #size of 0 bed units

Size_1_Bed = 44.0 #size of 1 bed units

Size_2_Bed = 60.0 #size of 2 bed units

Size_3_Bed = 72.0 #size of 3 bed units

Size_Parking = 30.0 #size of parking bay including manouvre space

##Size_0_Bed = 26.0 #size of 0 bed units

##Size_1_Bed = 55.0 #size of 0 bed units

##Size_2_Bed = 80.0 #size of 0 bed units

##Size_3_Bed = 100.0 #size of 0 bed units

##Size_Parking = 30.0 #size of parking bay including manouvre space

#Universal residential rent and sale factor for concessionary developments

Rent_Factor_Low = 0.25 #multiplication rent factor for low income units
Rent_Factor_Med = 0.65 #multiplication rent factor for medium income units
Rent_Factor_Open = 0.9 #multiplication rent factor for open market units
Sale_Factor_Open = 0.9 #multiplication sale factor for open market units

#Universal Percentage Residential Area Sold and Percentage Occupancy of Unsold Units
Perc_Resi_Sold_WO_Conc = 0.7 #proportion of residential units sold in development without concessions
Perc_Resi_Sold_W_Conc = 0.55 #proportion of residential units sold in development with concessions
Perc_Resi_Occupied = 0.8 #proportion of unsold residential units occupied

#Universal Building Maintenance
Maintenance_Building = 35.0 #maintenance per m2

#Universal Construction Cost
##Cnstrct_Resi = 7787.0*0.5 #residential construction cost at R7787/m2 based on STATSSA 2015 figure
##Cnstrct_Office = 7713.0*0.5 #office construction cost at R7713/m2 based on STATSSA 2015 figure
##Cnstrct_Retail = 7909.0*0.5 #retail construction cost at R7909/m2 based on STATSSA 2015 figure
##Cnstrct_Parking = 3000.0*0.5 #parking construction cost at R3000/m2 based on STATSSA 2015 figure
##Cnstrct_Resi = 9000 #residential construction cost AECOM 2011 (prestige apartment block lower est)
##Cnstrct_Office = 8700 #office construction cost AECOM 2011 (standard high rise spec mid est)
##Cnstrct_Retail = 6000 #retail construction cost AECOM 2011 (neighbourhood centre mid est)
##Cnstrct_Parking = 3750 #parking construction cost AECOM 2011 (basement mid est)

Cnstrct_Resi = 13400 #residential construction cost AECOM 2018 (prestige apartment block lower est)
Cnstrct_Office = 12950 #office construction cost AECOM 2018 (high-rise standard spec mid est)
Cnstrct_Retail = 9350 #retail construction cost AECOM 2018 (neighbourhood centres mid est)
Cnstrct_Parking = 5600 #parking construction cost AECOM 2018 (basement mid est)

#Universal Financing - Interest Rate
Interest_Rate = 0.1025 #Interest Rate on Loan (prime July 2018)
Interest_Calc_Freq = 12.0 #Number of times per year interest is calculated <https://www.iol.co.za/personal-finance/it-pays-to-understand-how-interest-works-1350994>

Module B – Raster Data Extraction

```
def main():
    pass

if __name__ == '__main__':
    main()

import arcpy
from Site_Configs_v2 import*
from arcpy.sa import*

arcpy.env.workspace = r'C:\Users\Philip\OneDrive\Masters - EM017\CIV5000Z\GIS\Trial_Database.gdb'

#specified layer to retrieve values from
##Source = r'C:\Users\Philip\OneDrive\Masters - EM017\CIV5000Z\GIS\Outputs\Land_Parcel_Clippped_Point_For_Zone_v1.shp'
Source = r'C:\Users\Philip\OneDrive\Masters - EM017\CIV5000Z\GIS\Outputs\Join_Output.shp'

#Raster Cell Size
Raster_Cell_Size = 9

#RASTER MANUAL INPUT DATA TO BE REPLACED WITH ACTUAL RASTER DATA
#Initialise Land Parcel Count
Parcel_Count_1 = 0
Parcel_Count_2 = 0
Parcel_Count_3 = 0
Parcel_Count_4 = 0
Parcel_Count_5 = 0

#Search Attributes Table and Define GIS Variables
Columns = ['SG26_CODE', 'Land_Use_Z', 'PT1_STATUS', 'PT2_STATUS', 'Suburb']

with arcpy.da.SearchCursor(Source, Columns) as cursor:

    for row in cursor:
        Site_Number_1_PRTY_NMBR = row[0]
        Site_Number_1_Zone = row[1]
        Site_Number_1_PT1_STATUS = row[2]
        Site_Number_1_PT2_STATUS = row[3]
        Site_Number_1_Suburb = row[4]

        if Site_Number_1_PRTY_NMBR == Site_Number_1:

            Parcel_Count_1 += 1
            Parcel_Suburb_1 = Site_Number_1_Suburb

            if Site_Number_1_PT1_STATUS == 0:
                Parcel_Parking_Zone_1 = 0
            elif Site_Number_1_PT1_STATUS == 1:
                Parcel_Parking_Zone_1 = 'PT1'
            if Site_Number_1_PT2_STATUS == 0:
                Parcel_Parking_Zone_1 = 0
            elif Site_Number_1_PT2_STATUS == 1:
                Parcel_Parking_Zone_1 = 'PT2'

            if Site_Number_1_Zone == 1:
                Parcel_Zone_1 = 'TR1'
            elif Site_Number_1_Zone == 2:
                Parcel_Zone_1 = 'None'
            elif Site_Number_1_Zone == 3:
                Parcel_Zone_1 = 'GR5'
            elif Site_Number_1_Zone == 4:
                Parcel_Zone_1 = 'GR4'
            elif Site_Number_1_Zone == 5:
                Parcel_Zone_1 = 'TR2'
```



```

elif Site_Number_1_Zone == 6:
    Parcel_Zone_1 = 'GB5'
elif Site_Number_1_Zone == 7:
    Parcel_Zone_1 = 'OS2'
elif Site_Number_1_Zone == 8:
    Parcel_Zone_1 = 'GR2'
elif Site_Number_1_Zone == 9:
    Parcel_Zone_1 = 'SR1'
elif Site_Number_1_Zone == 10:
    Parcel_Zone_1 = 'GB1'
elif Site_Number_1_Zone == 11:
    Parcel_Zone_1 = 'LB2'
elif Site_Number_1_Zone == 12:
    Parcel_Zone_1 = 'UT'
elif Site_Number_1_Zone == 13:
    Parcel_Zone_1 = 'CO1'
elif Site_Number_1_Zone == 14:
    Parcel_Zone_1 = 'CO2'
elif Site_Number_1_Zone == 15:
    Parcel_Zone_1 = 'MU2'
elif Site_Number_1_Zone == 16:
    Parcel_Zone_1 = 'MU3'
elif Site_Number_1_Zone == 17:
    Parcel_Zone_1 = 'GB7'
elif Site_Number_1_Zone == 18:
    Parcel_Zone_1 = 'LB1'
elif Site_Number_1_Zone == 19:
    Parcel_Zone_1 = 'GB2'
elif Site_Number_1_Zone == 20:
    Parcel_Zone_1 = 'LU'
elif Site_Number_1_Zone == 21:
    Parcel_Zone_1 = 'GB6'
elif Site_Number_1_Zone == 22:
    Parcel_Zone_1 = 'GR6'
elif Site_Number_1_Zone == 23:
    Parcel_Zone_1 = 'MU1'
elif Site_Number_1_Zone == 24:
    Parcel_Zone_1 = 'GR1'
elif Site_Number_1_Zone == 25:
    Parcel_Zone_1 = 'GB3'
elif Site_Number_1_Zone == 26:
    Parcel_Zone_1 = 'GB4'
elif Site_Number_1_Zone == 27:
    Parcel_Zone_1 = 'GI2'
elif Site_Number_1_Zone == 28:
    Parcel_Zone_1 = 'OS3'

print "Parcel 1:", Parcel_Count_1
print "Suburb 1:", Parcel_Suburb_1
print "Zone 1:", Parcel_Zone_1
print "Parking Zone 1:", Parcel_Parking_Zone_1

with arcpy.da.SearchCursor(Source, Columns) as cursor:

    for row in cursor:
        Site_Number_2_PRTY_NMBR = row[0]
        Site_Number_2_Zone = row[1]
        Site_Number_2_PT1_STATUS = row[2]
        Site_Number_2_PT2_STATUS = row[3]
        Site_Number_2_Suburb = row[4]

        if Site_Number_2_PRTY_NMBR == Site_Number_2:

            Parcel_Count_2 += 1
            Parcel_Suburb_2 = Site_Number_2_Suburb

```

```

if Site_Number_2_PT1_STATUS == 0:
    Parcel_Parking_Zone_2 = 0
elif Site_Number_2_PT1_STATUS == 1:
    Parcel_Parking_Zone_2 = 'PT1'
if Site_Number_2_PT2_STATUS == 0:
    Parcel_Parking_Zone_2 = 0
elif Site_Number_2_PT2_STATUS == 1:
    Parcel_Parking_Zone_2 = 'PT2'

if Site_Number_2_Zone == 1:
    Parcel_Zone_2 = 'TR1'
elif Site_Number_2_Zone == 2:
    Parcel_Zone_2 = 'None'
elif Site_Number_2_Zone == 3:
    Parcel_Zone_2 = 'GR5'
elif Site_Number_2_Zone == 4:
    Parcel_Zone_2 = 'GR4'
elif Site_Number_2_Zone == 5:
    Parcel_Zone_2 = 'TR2'
elif Site_Number_2_Zone == 6:
    Parcel_Zone_2 = 'GB5'
elif Site_Number_2_Zone == 7:
    Parcel_Zone_2 = 'OS2'
elif Site_Number_2_Zone == 8:
    Parcel_Zone_2 = 'GR2'
elif Site_Number_2_Zone == 9:
    Parcel_Zone_2 = 'SR1'
elif Site_Number_2_Zone == 10:
    Parcel_Zone_2 = 'GB1'
elif Site_Number_2_Zone == 11:
    Parcel_Zone_2 = 'LB2'
elif Site_Number_2_Zone == 12:
    Parcel_Zone_2 = 'UT'
elif Site_Number_2_Zone == 13:
    Parcel_Zone_2 = 'CO1'
elif Site_Number_2_Zone == 14:
    Parcel_Zone_2 = 'CO2'
elif Site_Number_2_Zone == 15:
    Parcel_Zone_2 = 'MU2'
elif Site_Number_2_Zone == 16:
    Parcel_Zone_2 = 'MU3'
elif Site_Number_2_Zone == 17:
    Parcel_Zone_2 = 'GB7'
elif Site_Number_2_Zone == 18:
    Parcel_Zone_2 = 'LB1'
elif Site_Number_2_Zone == 19:
    Parcel_Zone_2 = 'GB2'
elif Site_Number_2_Zone == 20:
    Parcel_Zone_2 = 'LU'
elif Site_Number_2_Zone == 21:
    Parcel_Zone_2 = 'GB6'
elif Site_Number_2_Zone == 22:
    Parcel_Zone_2 = 'GR6'
elif Site_Number_2_Zone == 23:
    Parcel_Zone_2 = 'MU1'
elif Site_Number_2_Zone == 24:
    Parcel_Zone_2 = 'GR1'
elif Site_Number_2_Zone == 25:
    Parcel_Zone_2 = 'GB3'
elif Site_Number_2_Zone == 26:
    Parcel_Zone_2 = 'GB4'
elif Site_Number_2_Zone == 27:
    Parcel_Zone_2 = 'GI2'
elif Site_Number_2_Zone == 28:
    Parcel_Zone_2 = 'OS3'

```

```

print "Parcel 2", Parcel_Count_2
print "Suburb 2:", Parcel_Suburb_2
print "Zone 2:", Parcel_Zone_2
print "Parking Zone 2:", Parcel_Parking_Zone_2

```

with arcpy.da.SearchCursor(Source, Columns) as cursor:

for row in cursor:

```

    Site_Number_3_PRTY_NMBR = row[0]
    Site_Number_3_Zone = row[1]
    Site_Number_3_PT1_STATUS = row[2]
    Site_Number_3_PT2_STATUS = row[3]
    Site_Number_3_Suburb = row[4]

```

if Site_Number_3_PRTY_NMBR == Site_Number_3:

```

    Parcel_Count_3 += 1
    Parcel_Suburb_3 = Site_Number_3_Suburb

```

```

    if Site_Number_3_PT1_STATUS == 0:
        Parcel_Parking_Zone_3 = 0
    elif Site_Number_3_PT1_STATUS == 1:
        Parcel_Parking_Zone_3 = 'PT1'
    if Site_Number_3_PT2_STATUS == 0:
        Parcel_Parking_Zone_3 = 0
    elif Site_Number_3_PT2_STATUS == 1:
        Parcel_Parking_Zone_3 = 'PT2'

```

```

    if Site_Number_3_Zone == 1:
        Parcel_Zone_3 = 'TR1'
    elif Site_Number_3_Zone == 2:
        Parcel_Zone_3 = 'None'
    elif Site_Number_3_Zone == 3:
        Parcel_Zone_3 = 'GR5'
    elif Site_Number_3_Zone == 4:
        Parcel_Zone_3 = 'GR4'
    elif Site_Number_3_Zone == 5:
        Parcel_Zone_3 = 'TR2'
    elif Site_Number_3_Zone == 6:
        Parcel_Zone_3 = 'GB5'
    elif Site_Number_3_Zone == 7:
        Parcel_Zone_3 = 'OS2'
    elif Site_Number_3_Zone == 8:
        Parcel_Zone_3 = 'GR2'
    elif Site_Number_3_Zone == 9:
        Parcel_Zone_3 = 'SR1'
    elif Site_Number_3_Zone == 10:
        Parcel_Zone_3 = 'GB1'
    elif Site_Number_3_Zone == 11:
        Parcel_Zone_3 = 'LB2'
    elif Site_Number_3_Zone == 12:
        Parcel_Zone_3 = 'UT'
    elif Site_Number_3_Zone == 13:
        Parcel_Zone_3 = 'CO1'
    elif Site_Number_3_Zone == 14:
        Parcel_Zone_3 = 'CO2'
    elif Site_Number_3_Zone == 15:
        Parcel_Zone_3 = 'MU2'
    elif Site_Number_3_Zone == 16:
        Parcel_Zone_3 = 'MU3'
    elif Site_Number_3_Zone == 17:
        Parcel_Zone_3 = 'GB7'
    elif Site_Number_3_Zone == 18:
        Parcel_Zone_3 = 'LB1'
    elif Site_Number_3_Zone == 19:
        Parcel_Zone_3 = 'GB2'

```

```

elif Site_Number_3_Zone == 20:
    Parcel_Zone_3 = 'LU'
elif Site_Number_3_Zone == 21:
    Parcel_Zone_3 = 'GB6'
elif Site_Number_3_Zone == 22:
    Parcel_Zone_3 = 'GR6'
elif Site_Number_3_Zone == 23:
    Parcel_Zone_3 = 'MU1'
elif Site_Number_3_Zone == 24:
    Parcel_Zone_3 = 'GR1'
elif Site_Number_3_Zone == 25:
    Parcel_Zone_3 = 'GB3'
elif Site_Number_3_Zone == 26:
    Parcel_Zone_3 = 'GB4'
elif Site_Number_3_Zone == 27:
    Parcel_Zone_3 = 'GI2'
elif Site_Number_3_Zone == 28:
    Parcel_Zone_3 = 'OS3'

print "Parcel 3", Parcel_Count_3
print "Suburb 3:", Parcel_Suburb_3
print "Zone 3:", Parcel_Zone_3
print "Parking Zone 3:", Parcel_Parking_Zone_3

with arcpy.da.SearchCursor(Source, Columns) as cursor:

    for row in cursor:
        Site_Number_4_PRTY_NMBR = row[0]
        Site_Number_4_Zone = row[1]
        Site_Number_4_PT1_STATUS = row[2]
        Site_Number_4_PT2_STATUS = row[3]
        Site_Number_4_Suburb = row[4]

        if Site_Number_4_PRTY_NMBR == Site_Number_4:

            Parcel_Count_4 += 1
            Parcel_Suburb_4 = Site_Number_4_Suburb

            if Site_Number_4_PT1_STATUS == 0:
                Parcel_Parking_Zone_4 = 0
            elif Site_Number_4_PT1_STATUS == 1:
                Parcel_Parking_Zone_4 = 'PT1'
            if Site_Number_4_PT2_STATUS == 0:
                Parcel_Parking_Zone_4 = 0
            elif Site_Number_4_PT2_STATUS == 1:
                Parcel_Parking_Zone_4 = 'PT2'

            if Site_Number_4_Zone == 1:
                Parcel_Zone_4 = 'TR1'
            elif Site_Number_4_Zone == 2:
                Parcel_Zone_4 = 'None'
            elif Site_Number_4_Zone == 3:
                Parcel_Zone_4 = 'GR5'
            elif Site_Number_4_Zone == 4:
                Parcel_Zone_4 = 'GR4'
            elif Site_Number_4_Zone == 5:
                Parcel_Zone_4 = 'TR2'
            elif Site_Number_4_Zone == 6:
                Parcel_Zone_4 = 'GB5'
            elif Site_Number_4_Zone == 7:
                Parcel_Zone_4 = 'OS2'
            elif Site_Number_4_Zone == 8:
                Parcel_Zone_4 = 'GR2'
            elif Site_Number_4_Zone == 9:
                Parcel_Zone_4 = 'SR1'
            elif Site_Number_4_Zone == 10:

```

```

        Parcel_Zone_4 = 'GB1'
    elif Site_Number_4_Zone == 11:
        Parcel_Zone_4 = 'LB2'
    elif Site_Number_4_Zone == 12:
        Parcel_Zone_4 = 'UT'
    elif Site_Number_4_Zone == 13:
        Parcel_Zone_4 = 'CO1'
    elif Site_Number_4_Zone == 14:
        Parcel_Zone_4 = 'CO2'
    elif Site_Number_4_Zone == 15:
        Parcel_Zone_4 = 'MU2'
    elif Site_Number_4_Zone == 16:
        Parcel_Zone_4 = 'MU3'
    elif Site_Number_4_Zone == 17:
        Parcel_Zone_4 = 'GB7'
    elif Site_Number_4_Zone == 18:
        Parcel_Zone_4 = 'LB1'
    elif Site_Number_4_Zone == 19:
        Parcel_Zone_4 = 'GB2'
    elif Site_Number_4_Zone == 20:
        Parcel_Zone_4 = 'LU'
    elif Site_Number_4_Zone == 21:
        Parcel_Zone_4 = 'GB6'
    elif Site_Number_4_Zone == 22:
        Parcel_Zone_4 = 'GR6'
    elif Site_Number_4_Zone == 23:
        Parcel_Zone_4 = 'MU1'
    elif Site_Number_4_Zone == 24:
        Parcel_Zone_4 = 'GR1'
    elif Site_Number_4_Zone == 25:
        Parcel_Zone_4 = 'GB3'
    elif Site_Number_4_Zone == 26:
        Parcel_Zone_4 = 'GB4'
    elif Site_Number_4_Zone == 27:
        Parcel_Zone_4 = 'GI2'
    elif Site_Number_4_Zone == 28:
        Parcel_Zone_4 = 'OS3'

print "Parcel 4", Parcel_Count_4
print "Suburb 4:", Parcel_Suburb_4
print "Zone 4:", Parcel_Zone_4
print "Parking Zone 4:", Parcel_Parking_Zone_4

with arcpy.da.SearchCursor(Source, Columns) as cursor:

    for row in cursor:
        Site_Number_5_PRTY_NMBR = row[0]
        Site_Number_5_Zone = row[1]
        Site_Number_5_PT1_STATUS = row[2]
        Site_Number_5_PT2_STATUS = row[3]
        Site_Number_5_Suburb = row[4]

        if Site_Number_5_PRTY_NMBR == Site_Number_5:

            Parcel_Count_5 += 1
            Parcel_Suburb_5 = Site_Number_5_Suburb

            if Site_Number_5_PT1_STATUS == 0:
                Parcel_Parking_Zone_5 = 0
            elif Site_Number_5_PT1_STATUS == 1:
                Parcel_Parking_Zone_5 = 'PT1'
            if Site_Number_5_PT2_STATUS == 0:
                Parcel_Parking_Zone_5 = 0
            elif Site_Number_5_PT2_STATUS == 1:
                Parcel_Parking_Zone_5 = 'PT2'

```

```

if Site_Number_5_Zone == 1:
    Parcel_Zone_5 = 'TR1'
elif Site_Number_5_Zone == 2:
    Parcel_Zone_5 = 'None'
elif Site_Number_5_Zone == 3:
    Parcel_Zone_5 = 'GR5'
elif Site_Number_5_Zone == 4:
    Parcel_Zone_5 = 'GR4'
elif Site_Number_5_Zone == 5:
    Parcel_Zone_5 = 'TR2'
elif Site_Number_5_Zone == 6:
    Parcel_Zone_5 = 'GB5'
elif Site_Number_5_Zone == 7:
    Parcel_Zone_5 = 'OS2'
elif Site_Number_5_Zone == 8:
    Parcel_Zone_5 = 'GR2'
elif Site_Number_5_Zone == 9:
    Parcel_Zone_5 = 'SR1'
elif Site_Number_5_Zone == 10:
    Parcel_Zone_5 = 'GB1'
elif Site_Number_5_Zone == 11:
    Parcel_Zone_5 = 'LB2'
elif Site_Number_5_Zone == 12:
    Parcel_Zone_5 = 'UT'
elif Site_Number_5_Zone == 13:
    Parcel_Zone_5 = 'CO1'
elif Site_Number_5_Zone == 14:
    Parcel_Zone_5 = 'CO2'
elif Site_Number_5_Zone == 15:
    Parcel_Zone_5 = 'MU2'
elif Site_Number_5_Zone == 16:
    Parcel_Zone_5 = 'MU3'
elif Site_Number_5_Zone == 17:
    Parcel_Zone_5 = 'GB7'
elif Site_Number_5_Zone == 18:
    Parcel_Zone_5 = 'LB1'
elif Site_Number_5_Zone == 19:
    Parcel_Zone_5 = 'GB2'
elif Site_Number_5_Zone == 20:
    Parcel_Zone_5 = 'LU'
elif Site_Number_5_Zone == 21:
    Parcel_Zone_5 = 'GB6'
elif Site_Number_5_Zone == 22:
    Parcel_Zone_5 = 'GR6'
elif Site_Number_5_Zone == 23:
    Parcel_Zone_5 = 'MU1'
elif Site_Number_5_Zone == 24:
    Parcel_Zone_5 = 'GR1'
elif Site_Number_5_Zone == 25:
    Parcel_Zone_5 = 'GB3'
elif Site_Number_5_Zone == 26:
    Parcel_Zone_5 = 'GB4'
elif Site_Number_5_Zone == 27:
    Parcel_Zone_5 = 'GI2'
elif Site_Number_5_Zone == 28:
    Parcel_Zone_5 = 'OS3'

print "Parcel 5", Parcel_Count_5
print "Suburb 5:", Parcel_Suburb_5
print "Zone 5:", Parcel_Zone_5
print "Parking Zone 5:", Parcel_Parking_Zone_5

#NON-CONFIGURABLE CHECKS - DO NOT EDIT:

#Assess user's land use split selection vs parcel current zone and redistribute if required - Site 1
if 'SR' in Parcel_Zone_1:

```

```

    Resi_WO_Conc_1 = 1.0 #Force Resi Only
    Office_WO_Conc_1 = 0.0 #Force Resi Only
    Retail_WO_Conc_1 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 1 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Parcel_Zone_1:
    Resi_WO_Conc_1 = 1.0 #Force Resi Only
    Office_WO_Conc_1 = 0.0 #Force Resi Only
    Retail_WO_Conc_1 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 1 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Parcel_Zone_1:
    Resi_WO_Conc_Temp_1 = Resi_WO_Conc_1 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_WO_Conc_Temp_1 = Office_WO_Conc_1 #Setup temporary variable for use split without concessions to allow adjustment of
actual variables
    Retail_WO_Conc_Temp_1 = Retail_WO_Conc_1 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_WO_Conc_1 = 0.0 #Force No Resi
    Office_WO_Conc_1 =
Office_WO_Conc_Temp_1+Resi_WO_Conc_Temp_1*(Office_WO_Conc_Temp_1/(Retail_WO_Conc_Temp_1+Office_WO_Conc_Temp_1))
#Redistribute resi to office
    Retail_WO_Conc_1 =
Retail_WO_Conc_Temp_1+Resi_WO_Conc_Temp_1*(Retail_WO_Conc_Temp_1/(Office_WO_Conc_Temp_1+Retail_WO_Conc_Temp_1))
#Redistribute resi to retail
else:
    print "Site 1 without concessions allows all land uses"

#Assess user's land use split selection vs parcel preferred zone and redistribute if required - Site 1
if 'SR' in Pref_LU_Zone_1:
    Resi_W_Conc_1 = 1.0 #Force Resi Only
    Office_W_Conc_1 = 0.0 #Force Resi Only
    Retail_W_Conc_1 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 1 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Pref_LU_Zone_1:
    Resi_W_Conc_1 = 1.0 #Force Resi Only
    Office_W_Conc_1 = 0.0 #Force Resi Only
    Retail_W_Conc_1 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 1 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Pref_LU_Zone_1:
    Resi_W_Conc_Temp_1 = Resi_W_Conc_1 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_W_Conc_Temp_1 = Office_W_Conc_1 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Retail_W_Conc_Temp_1 = Retail_W_Conc_1 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_W_Conc_1 = 0.0 #Force No Resi
    Office_W_Conc_1 =
Office_W_Conc_Temp_1+Resi_W_Conc_Temp_1*(Office_W_Conc_Temp_1/(Retail_W_Conc_Temp_1+Office_W_Conc_Temp_1))
#Redistribute resi to office
    Retail_W_Conc_1 =
Retail_W_Conc_Temp_1+Resi_W_Conc_Temp_1*(Retail_W_Conc_Temp_1/(Office_W_Conc_Temp_1+Retail_W_Conc_Temp_1))
#Redistribute resi to retail
else:
    print "Site 1 with concessions allows all land uses"

#Assess user's land use split selection vs parcel current zone and redistribute if required - Site 2
if 'SR' in Parcel_Zone_2:
    Resi_WO_Conc_2 = 1.0 #Force Resi Only
    Office_WO_Conc_2 = 0.0 #Force Resi Only
    Retail_WO_Conc_2 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 2 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Parcel_Zone_2:
    Resi_WO_Conc_2 = 1.0 #Force Resi Only
    Office_WO_Conc_2 = 0.0 #Force Resi Only
    Retail_WO_Conc_2 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 2 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Parcel_Zone_2:

```

```

    Resi_WO_Conc_Temp_2 = Resi_WO_Conc_2 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_WO_Conc_Temp_2 = Office_WO_Conc_2 #Setup temporary variable for use split without concessions to allow adjustment of
actual variables
    Retail_WO_Conc_Temp_2 = Retail_WO_Conc_2 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_WO_Conc_2 = 0.0 #Force No Resi
    Office_WO_Conc_2 =
Office_WO_Conc_Temp_2+Resi_WO_Conc_Temp_2*(Office_WO_Conc_Temp_2/(Retail_WO_Conc_Temp_2+Office_WO_Conc_Temp_2))
#Redistribute resi to office
    Retail_WO_Conc_2 =
Retail_WO_Conc_Temp_2+Resi_WO_Conc_Temp_2*(Retail_WO_Conc_Temp_2/(Office_WO_Conc_Temp_2+Retail_WO_Conc_Temp_2))
#Redistribute resi to retail
else:
    print "Site 2 without concessions allows all land uses"

#Assess user's land use split selection vs parcel preferred zone and redistribute if required - Site 2
if 'SR' in Pref_LU_Zone_2:
    Resi_W_Conc_2 = 1.0 #Force Resi Only
    Office_W_Conc_2 = 0.0 #Force Resi Only
    Retail_W_Conc_2 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 2 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Pref_LU_Zone_2:
    Resi_W_Conc_2 = 1.0 #Force Resi Only
    Office_W_Conc_2 = 0.0 #Force Resi Only
    Retail_W_Conc_2 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 2 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Pref_LU_Zone_2:
    Resi_W_Conc_Temp_2 = Resi_W_Conc_2 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_W_Conc_Temp_2 = Office_W_Conc_2 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Retail_W_Conc_Temp_2 = Retail_W_Conc_2 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_W_Conc_2 = 0.0 #Force No Resi
    Office_W_Conc_2 =
Office_W_Conc_Temp_2+Resi_W_Conc_Temp_2*(Office_W_Conc_Temp_2/(Retail_W_Conc_Temp_2+Office_W_Conc_Temp_2))
#Redistribute resi to office
    Retail_W_Conc_2 =
Retail_W_Conc_Temp_2+Resi_W_Conc_Temp_2*(Retail_W_Conc_Temp_2/(Office_W_Conc_Temp_2+Retail_W_Conc_Temp_2))
#Redistribute resi to retail
else:
    print "Site 2 with concessions allows all land uses"

#Assess user's land use split selection vs parcel current zone and redistribute if required - Site 3
if 'SR' in Parcel_Zone_3:
    Resi_WO_Conc_3 = 1.0 #Force Resi Only
    Office_WO_Conc_3 = 0.0 #Force Resi Only
    Retail_WO_Conc_3 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 3 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Parcel_Zone_3:
    Resi_WO_Conc_3 = 1.0 #Force Resi Only
    Office_WO_Conc_3 = 0.0 #Force Resi Only
    Retail_WO_Conc_3 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 3 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Parcel_Zone_3:
    Resi_WO_Conc_Temp_3 = Resi_WO_Conc_3 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_WO_Conc_Temp_3 = Office_WO_Conc_3 #Setup temporary variable for use split without concessions to allow adjustment of
actual variables
    Retail_WO_Conc_Temp_3 = Retail_WO_Conc_3 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_WO_Conc_3 = 0.0 #Force No Resi
    Office_WO_Conc_3 =
Office_WO_Conc_Temp_3+Resi_WO_Conc_Temp_3*(Office_WO_Conc_Temp_3/(Retail_WO_Conc_Temp_3+Office_WO_Conc_Temp_3))
#Redistribute resi to office

```



```

    Retail_WO_Conc_3 =
Retail_WO_Conc_Temp_3+Resi_WO_Conc_Temp_3*(Retail_WO_Conc_Temp_3/(Office_WO_Conc_Temp_3+Retail_WO_Conc_Temp_3))
#Redistribute resi to retail
else:
    print "Site 3 without concessions allows all land uses"

#Assess user's land use split selection vs parcel preferred zone and redistribute if required - Site 3
if 'SR' in Pref_LU_Zone_3:
    Resi_W_Conc_3 = 1.0 #Force Resi Only
    Office_W_Conc_3 = 0.0 #Force Resi Only
    Retail_W_Conc_3 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 3 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Pref_LU_Zone_3:
    Resi_W_Conc_3 = 1.0 #Force Resi Only
    Office_W_Conc_3 = 0.0 #Force Resi Only
    Retail_W_Conc_3 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 3 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Pref_LU_Zone_3:
    Resi_W_Conc_Temp_3 = Resi_W_Conc_3 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_W_Conc_Temp_3 = Office_W_Conc_3 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Retail_W_Conc_Temp_3 = Retail_W_Conc_3 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_W_Conc_3 = 0.0 #Force No Resi
    Office_W_Conc_3 =
Office_W_Conc_Temp_3+Resi_W_Conc_Temp_3*(Office_W_Conc_Temp_3/(Retail_W_Conc_Temp_3+Office_W_Conc_Temp_3))
#Redistribute resi to office
    Retail_W_Conc_3 =
Retail_W_Conc_Temp_3+Resi_W_Conc_Temp_3*(Retail_W_Conc_Temp_3/(Office_W_Conc_Temp_3+Retail_W_Conc_Temp_3))
#Redistribute resi to retail
else:
    print "Site 3 with concessions allows all land uses"

#Assess user's land use split selection vs parcel current zone and redistribute if required - Site 4
if 'SR' in Parcel_Zone_4:
    Resi_WO_Conc_4 = 1.0 #Force Resi Only
    Office_WO_Conc_4 = 0.0 #Force Resi Only
    Retail_WO_Conc_4 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 4 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Parcel_Zone_4:
    Resi_WO_Conc_4 = 1.0 #Force Resi Only
    Office_WO_Conc_4 = 0.0 #Force Resi Only
    Retail_WO_Conc_4 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 4 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Parcel_Zone_4:
    Resi_WO_Conc_Temp_4 = Resi_WO_Conc_4 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_WO_Conc_Temp_4 = Office_WO_Conc_4 #Setup temporary variable for use split without concessions to allow adjustment of
actual variables
    Retail_WO_Conc_Temp_4 = Retail_WO_Conc_4 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_WO_Conc_4 = 0.0 #Force No Resi
    Office_WO_Conc_4 =
Office_WO_Conc_Temp_4+Resi_WO_Conc_Temp_4*(Office_WO_Conc_Temp_4/(Retail_WO_Conc_Temp_4+Office_WO_Conc_Temp_4))
#Redistribute resi to office
    Retail_WO_Conc_4 =
Retail_WO_Conc_Temp_4+Resi_WO_Conc_Temp_4*(Retail_WO_Conc_Temp_4/(Office_WO_Conc_Temp_4+Retail_WO_Conc_Temp_4))
#Redistribute resi to retail
else:
    print "Site 4 without concessions allows all land uses"

#Assess user's land use split selection vs parcel preferred zone and redistribute if required - Site 4
if 'SR' in Pref_LU_Zone_4:
    Resi_W_Conc_4 = 1.0 #Force Resi Only
    Office_W_Conc_4 = 0.0 #Force Resi Only

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```

    Retail_W_Conc_4 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 4 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Pref_LU_Zone_4:
    Resi_W_Conc_4 = 1.0 #Force Resi Only
    Office_W_Conc_4 = 0.0 #Force Resi Only
    Retail_W_Conc_4 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 4 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Pref_LU_Zone_4:
    Resi_W_Conc_Temp_4 = Resi_W_Conc_4 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_W_Conc_Temp_4 = Office_W_Conc_4 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Retail_W_Conc_Temp_4 = Retail_W_Conc_4 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_W_Conc_4 = 0.0 #Force No Resi
    Office_W_Conc_4
Office_W_Conc_Temp_4+Resi_W_Conc_Temp_4*(Office_W_Conc_Temp_4/(Retail_W_Conc_Temp_4+Office_W_Conc_Temp_4))
#Redistribute resi to office
    Retail_W_Conc_4
Retail_W_Conc_Temp_4+Resi_W_Conc_Temp_4*(Retail_W_Conc_Temp_4/(Office_W_Conc_Temp_4+Retail_W_Conc_Temp_4))
#Redistribute resi to retail
else:
    print "Site 4 with concessions allows all land uses"

#Assess user's land use split selection vs parcel current zone and redistribute if required - Site 5
if 'SR' in Parcel_Zone_5:
    Resi_WO_Conc_5 = 1.0 #Force Resi Only
    Office_WO_Conc_5 = 0.0 #Force Resi Only
    Retail_WO_Conc_5 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 5 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Parcel_Zone_5:
    Resi_WO_Conc_5 = 1.0 #Force Resi Only
    Office_WO_Conc_5 = 0.0 #Force Resi Only
    Retail_WO_Conc_5 = 0.0 #Force Resi Only
    print "Current Zone of Parcel 5 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Parcel_Zone_5:
    Resi_WO_Conc_Temp_5 = Resi_WO_Conc_5 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Office_WO_Conc_Temp_5 = Office_WO_Conc_5 #Setup temporary variable for use split without concessions to allow adjustment of
actual variables
    Retail_WO_Conc_Temp_5 = Retail_WO_Conc_5 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
    Resi_WO_Conc_5 = 0.0 #Force No Resi
    Office_WO_Conc_5
Office_WO_Conc_Temp_5+Resi_WO_Conc_Temp_5*(Office_WO_Conc_Temp_5/(Retail_WO_Conc_Temp_5+Office_WO_Conc_Temp_5))
#Redistribute resi to office
    Retail_WO_Conc_5
Retail_WO_Conc_Temp_5+Resi_WO_Conc_Temp_5*(Retail_WO_Conc_Temp_5/(Office_WO_Conc_Temp_5+Retail_WO_Conc_Temp_5))
#Redistribute resi to retail
else:
    print "Site 5 without concessions allows all land uses"

#Assess user's land use split selection vs parcel preferred zone and redistribute if required - Site 5
if 'SR' in Pref_LU_Zone_5:
    Resi_W_Conc_5 = 1.0 #Force Resi Only
    Office_W_Conc_5 = 0.0 #Force Resi Only
    Retail_W_Conc_5 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 5 allows Resi use only: building use has been automatically configured accordingly"
elif 'GR' in Pref_LU_Zone_5:
    Resi_W_Conc_5 = 1.0 #Force Resi Only
    Office_W_Conc_5 = 0.0 #Force Resi Only
    Retail_W_Conc_5 = 0.0 #Force Resi Only
    print "Preferred Zone of Parcel 5 allows Resi use only: building use has been automatically configured accordingly"
elif 'GI' in Pref_LU_Zone_5:
    Resi_W_Conc_Temp_5 = Resi_W_Conc_5 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables

```

```

Office_W_Conc_Temp_5 = Office_W_Conc_5 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
Retail_W_Conc_Temp_5 = Retail_W_Conc_5 #Setup temporary variable for use split without concessions to allow adjustment of actual
variables
Resi_W_Conc_5 = 0.0 #Force No Resi
Office_W_Conc_5
Office_W_Conc_Temp_5+Resi_W_Conc_Temp_5*(Office_W_Conc_Temp_5/(Retail_W_Conc_Temp_5+Office_W_Conc_Temp_5))
#Redistribute resi to office
Retail_W_Conc_5
Retail_W_Conc_Temp_5+Resi_W_Conc_Temp_5*(Retail_W_Conc_Temp_5/(Office_W_Conc_Temp_5+Retail_W_Conc_Temp_5))
#Redistribute resi to retail
else:
    print "Site 5 with concessions allows all land uses"

```

Module C – Suburb Data

```
def main():
    pass

if __name__ == '__main__':
    main()

from Site_Configs_v2 import*

#Final Suburb Numbers:
BANTRY_BAY = 29
BROOKLYN = 26
CAPE_TOWN_CITY_CENTRE = 22
FORESHORE = 18
FRESNAYE = 4
GARDENS = 16
GREEN_POINT = 11
MAITLAND = 21
MAITLAND_GARDEN_VILLAGE = 12
MOUILLE_POINT = 2
MOWBRAY = 27
OBSERVATORY = 20
ORANJEZICHT = 23
PAARDEN_EILAND = 14
RONDEBOSCH = 19
ROSEBANK = 7
SALT_RIVER = 15
SCHOTSCHEKLOOF = 1
SEA_POINT = 28
TAMBOERSKLOOF = 3
THREE_ANCHOR_BAY = 24
VREDEHOEK = 10
WOODSTOCK = 25
ZONNEBLOEM = 17

#Suburb Vacant Land Price per m2
BANTRY_BAY_Land = 10754.0 #Atlantic Seaboard 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
BROOKLYN_Land = 841.0 #Northern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
##CAPE_TOWN_CITY_CENTRE_Land = 4991.0 #City Bowl 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
CAPE_TOWN_CITY_CENTRE_Land = 19034.0 #Property24 Review 2018
FORESHORE_Land = 4991.0 #City Bowl 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
FRESNAYE_Land = 10754.0 #Atlantic Seaboard 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
GARDENS_Land = 4991.0 #City Bowl 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
GREEN_POINT_Land = 10754.0 #Atlantic Seaboard 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
##MAITLAND_Land = 841.0 #Property24 Review 2018
MAITLAND_Land = 2333.0 #Northern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
MAITLAND_GARDEN_VILLAGE_Land = 841.0 #Northern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
MOUILLE_POINT_Land = 10754.0 #Atlantic Seaboard 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
MOWBRAY_Land = 2506.0 #Southern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
##OBSERVATORY_Land = 2506.0 #Southern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
OBSERVATORY_Land = 7466.0 #Property24 Review 2018
ORANJEZICHT_Land = 4991.0 #City Bowl 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
PAARDEN_EILAND_Land = 2506.0 #Southern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
RONDEBOSCH_Land = 2506.0 #Southern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
ROSEBANK_Land = 2506.0 #Southern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
SALT_RIVER_Land = 2506.0 #Southern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
SCHOTSCHEKLOOF_Land = 4991.0 #City Bowl 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
##SEA_POINT_Land = 10754.0 #Atlantic Seaboard 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
SEA_POINT_Land = 22672.0 #Property24 Review 2018
TAMBOERSKLOOF_Land = 4991.0 #City Bowl 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
THREE_ANCHOR_BAY_Land = 10754.0 #Atlantic Seaboard 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
VREDEHOEK_Land = 4991.0 #City Bowl 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
WOODSTOCK_Land = 2506.0 #Southern Suburbs 2011/2012 https://ctproperty.weebly.com/building-price-vs-buying-price.html
```

##ZONNEBLOEM_Land = 2506.0 #Southern Suburbs 2011/2012 <https://ctproperty.weebly.com/building-price-vs-buying-price.html>
 ZONNEBLOEM_Land = 6952.0 #Property24 Review

#Suburb Open Market Sale Price Without Concessions per m2

BANTRY_BAY_WO_Conc_Sale = 36795.0 #Bantry Bay 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 BROOKLYN_WO_Conc_Sale = 2874.0 #Brooklyn 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ##CAPE_TOWN_CITY_CENTRE_WO_Conc_Sale = 15140.0 #Cape Town 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 CAPE_TOWN_CITY_CENTRE_WO_Conc_Sale = 57207.0 #Property24 2018 Est per m2
 FORESHORE_WO_Conc_Sale = 15140.0 #Cape Town 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 FRESNAYE_WO_Conc_Sale = 16357.0 #Fresnaye 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 GARDENS_WO_Conc_Sale = 16870.0 #Gardens 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 GREEN_POINT_WO_Conc_Sale = 17518.0 #Green Point 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ##MAITLAND_WO_Conc_Sale = 2475.0 #Maitland 2011 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 MAITLAND_WO_Conc_Sale = 14034.0 #Property24 2018 Est per m2
 MAITLAND_GARDEN_VILLAGE_WO_Conc_Sale = 2475.0 #Maitland 2011 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 MOUILLE_POINT_WO_Conc_Sale = 28005.0 #Mouille Point 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 MOWBRAY_WO_Conc_Sale = 7895.0 #Mowbray 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ##OBSERVATORY_WO_Conc_Sale = 8170.0 #Observatory 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 OBSERVATORY_WO_Conc_Sale = 36658.0 #Property24 2018 Est per m2
 ORANJEZICHT_WO_Conc_Sale = 14394.0 #Oranjezicht 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 PAARDEN_EILAND_WO_Conc_Sale = 2874.0 #Brooklyn 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 RONDEBOSCH_WO_Conc_Sale = 11301.0 #Rondebosch 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ROSEBANK_WO_Conc_Sale = 11552.0 #Rosebank 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 SALT_RIVER_WO_Conc_Sale = 12272.0 #Salt River 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 SCHOTSCHERKLOOF_WO_Conc_Sale = 9794.0 #Bo-Kaap 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ##SEA_POINT_WO_Conc_Sale = 17660.0 #Sea Point 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 SEA_POINT_WO_Conc_Sale = 57729.0 #Property24 2018 Est per m2
 TAMBOERSKLOOF_WO_Conc_Sale = 15533.0 #Tamboerskloof 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 THREE_ANCHOR_BAY_WO_Conc_Sale = 16495.0 #Three Anchor Bay 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 VREDEHOEK_WO_Conc_Sale = 14146.0 #Vredehoek 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 WOODSTOCK_WO_Conc_Sale = 7581.0 #Woodstock 2011 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ##ZONNEBLOEM_WO_Conc_Sale = 9695.0 #Zonnebloem 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ZONNEBLOEM_WO_Conc_Sale = 36207.0 #Property24 2018 Est per m2

#Suburb Open Market Sale Price With Concessions per m2

BANTRY_BAY_W_Conc_Sale = BANTRY_BAY_WO_Conc_Sale*Sale_Factor_Open #Bantry Bay 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 BROOKLYN_W_Conc_Sale = BROOKLYN_WO_Conc_Sale*Sale_Factor_Open #Brooklyn 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 CAPE_TOWN_CITY_CENTRE_W_Conc_Sale = CAPE_TOWN_CITY_CENTRE_WO_Conc_Sale*Sale_Factor_Open #Cape Town 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 FORESHORE_W_Conc_Sale = FORESHORE_WO_Conc_Sale*Sale_Factor_Open #Cape Town 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 FRESNAYE_W_Conc_Sale = FRESNAYE_WO_Conc_Sale*Sale_Factor_Open #Fresnaye 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 GARDENS_W_Conc_Sale = GARDENS_WO_Conc_Sale*Sale_Factor_Open #Gardens 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 GREEN_POINT_W_Conc_Sale = GREEN_POINT_WO_Conc_Sale*Sale_Factor_Open #Green Point 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 MAITLAND_W_Conc_Sale = MAITLAND_WO_Conc_Sale*Sale_Factor_Open #Maitland 2011 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 MAITLAND_GARDEN_VILLAGE_W_Conc_Sale = MAITLAND_GARDEN_VILLAGE_WO_Conc_Sale*Sale_Factor_Open #Maitland 2011 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 MOUILLE_POINT_W_Conc_Sale = MOUILLE_POINT_WO_Conc_Sale*Sale_Factor_Open #Mouille Point 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 MOWBRAY_W_Conc_Sale = MOWBRAY_WO_Conc_Sale*Sale_Factor_Open #Mowbray 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 OBSERVATORY_W_Conc_Sale = OBSERVATORY_WO_Conc_Sale*Sale_Factor_Open #Oranjezicht 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ORANJEZICHT_W_Conc_Sale = ORANJEZICHT_WO_Conc_Sale*Sale_Factor_Open #Oranjezicht 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 PAARDEN_EILAND_W_Conc_Sale = PAARDEN_EILAND_WO_Conc_Sale*Sale_Factor_Open #Brooklyn 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>

RONDEBOSCH_W_Conc_Sale = RONDEBOSCH_WO_Conc_Sale*Sale_Factor_Open #Rondebosch 2012
<https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ROSEBANK_W_Conc_Sale = ROSEBANK_WO_Conc_Sale*Sale_Factor_Open #Rosebank 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 SALT_RIVER_W_Conc_Sale = SALT_RIVER_WO_Conc_Sale*Sale_Factor_Open #Salt River 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 SCHOTSCHEKLOOF_W_Conc_Sale = SCHOTSCHEKLOOF_WO_Conc_Sale*Sale_Factor_Open #Bo-Kaap 2012
<https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 SEA_POINT_W_Conc_Sale = SEA_POINT_WO_Conc_Sale*Sale_Factor_Open #Sea Point 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 TAMBOERSKLOOF_W_Conc_Sale = TAMBOERSKLOOF_WO_Conc_Sale*Sale_Factor_Open #Tamboerskloof 2012
<https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 THREE_ANCHOR_BAY_W_Conc_Sale = THREE_ANCHOR_BAY_WO_Conc_Sale*Sale_Factor_Open #Three Anchor Bay 2012
<https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 VREDEHOEK_W_Conc_Sale = VREDEHOEK_WO_Conc_Sale*Sale_Factor_Open #Vredehoek 2012 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 WOODSTOCK_W_Conc_Sale = WOODSTOCK_WO_Conc_Sale*Sale_Factor_Open #Woodstock 2011 <https://ctproperty.weebly.com/square-meter-prices-by-area.html>
 ZONNEBLOEM_W_Conc_Sale = ZONNEBLOEM_WO_Conc_Sale*Sale_Factor_Open #Zonnebloem 2012
<https://ctproperty.weebly.com/square-meter-prices-by-area.html>

#Suburb Municipal Evaluation per m2

BANTRY_BAY_Muni = 23188.41 #Bantry Bay Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 BROOKLYN_Muni = 5510.20 #Brooklyn Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 ##CAPE_TOWN_CITY_CENTRE_Muni = 21238.94 #Cape Town City Centre Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 CAPE_TOWN_CITY_CENTRE_Muni = 31077.79 #Cape Town City Centre Valuation suburbs 2018 inflation adjusted
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 FORESHORE_Muni = 25369.0 #Cape Town City Centre Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 FRESNAYE_Muni = 16497.46 #Fresnaye Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 GARDENS_Muni = 14462.81 #Gardens Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 GREEN_POINT_Muni = 15486.73 #Green Point Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 ##MAITLAND_Muni = 4078.43 #Maitland Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 MAITLAND_Muni = 6085.18 #Maitland Valuation suburbs 2018 inflation adjusted
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 MAITLAND_GARDEN_VILLAGE_Muni = 7017.54 #Maitland Garden Village Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 MOUILLE_POINT_Muni = 14705.88 #Mouille Point Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 MOWBRAY_Muni = 8064.52 #Mowbray Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))
 ##OBSERVATORY_Muni = 8759.69 #Observatory Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+values\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+values))

OBSERVATORY_Muni = 14244.69 #Observatory Valuation suburbs 2018 inflation adjusted
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

ORANJEZICHT_Muni = 14871.38 #Oranjezicht Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

PAARDEN_EILAND_Muni = 5510.20 #Brooklyn Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

RONDEBOSCH_Muni = 9888.06 #Rondebosch Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

ROSEBANK_Muni = 10066.08 #Rosebank Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

SALT_RIVER_Muni = 4626.17 #Salt River Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

SCHOTSCHEKLOOF_Muni = 9655.17 #Bo-Kaap Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

##SEA_POINT_Muni = 15698.20 #Sea Point Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

SEA_POINT_Muni = 23728.31 #Sea Point Valuation suburbs 2018 inflation adjusted
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

TAMBOERSKLOOF_Muni = 14919.35 #Tamboerskloof Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

THREE_ANCHOR_BAY_Muni = 13653.85 #Three Anchor Bay Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

VREDEHOEK_Muni = 13636.36 #Vredehoek Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

WOODSTOCK_Muni = 6946.56 #Woodstock Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

##ZONNEBLOEM_Muni = 6944.44 #Zonnebloem Valuation suburbs 2012
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

ZONNEBLOEM_Muni = 9187.82 #Zonnebloem Valuation suburbs 2018 inflation adjusted
[http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+\(median+valu es\)](http://web1.capetown.gov.za/web1/opendataportal/DatasetDetail?DatasetName=Freehold+residential+property+valuations+(median+valu es))

#Suburb Open Market Residential Without Concessions Rent Price per m2

BANTRY_BAY_Rent_WO_Conc_Res = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

BROOKLYN_Rent_WO_Conc_Res = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

##CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res = 231.0 #Property24 Est per m2

FORESHORE_Rent_WO_Conc_Res = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

FRESNAYE_Rent_WO_Conc_Res = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

GARDENS_Rent_WO_Conc_Res = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

GREEN_POINT_Rent_WO_Conc_Res = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

##MAITLAND_Rent_WO_Conc_Res = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

MAITLAND_Rent_WO_Conc_Res = 131.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

MOUILLE_POINT_Rent_WO_Conc_Res = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

MOWBRAY_Rent_WO_Conc_Res = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

##OBSERVATORY_Rent_WO_Conc_Res = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

OBSERVATORY_Rent_WO_Conc_Res = 210.0 #Property24 Est per m2

ORANJEZICHT_Rent_WO_Conc_Res = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

PAARDEN_EILAND_Rent_WO_Conc_Res = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

RONDEBOSCH_Rent_WO_Conc_Res = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ROSEBANK_Rent_WO_Conc_Res = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SALT_RIVER_Rent_WO_Conc_Res = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SCHOTSCHEKLOOF_Rent_WO_Conc_Res = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ##SEA_POINT_Rent_WO_Conc_Res = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SEA_POINT_Rent_WO_Conc_Res = 187.0 #Property24 Est per m2
 TAMBOERSKLOOF_Rent_WO_Conc_Res = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 THREE_ANCHOR_BAY_Rent_WO_Conc_Res = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 VREDEHOEK_Rent_WO_Conc_Res = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 WOODSTOCK_Rent_WO_Conc_Res = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ##ZONNEBLOEM_Rent_WO_Conc_Res = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ZONNEBLOEM_Rent_WO_Conc_Res = 198.0 #Property24 Est per m2

#Suburb Open Market Residential With Concessions Rent Price per m2

BANTRY_BAY_Rent_W_Conc_Res = BANTRY_BAY_Rent_WO_Conc_Res*Rent_Factor_Open #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 BROOKLYN_Rent_W_Conc_Res = BROOKLYN_Rent_WO_Conc_Res*Rent_Factor_Open #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 CAPE_TOWN_CITY_CENTRE_Rent_W_Conc_Res = CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res*Rent_Factor_Open #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 FORESHORE_Rent_W_Conc_Res = FORESHORE_Rent_WO_Conc_Res*Rent_Factor_Open #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 FRESNAYE_Rent_W_Conc_Res = FRESNAYE_Rent_WO_Conc_Res*Rent_Factor_Open #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 GARDENS_Rent_W_Conc_Res = GARDENS_Rent_WO_Conc_Res*Rent_Factor_Open #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 GREEN_POINT_Rent_W_Conc_Res = GREEN_POINT_Rent_WO_Conc_Res*Rent_Factor_Open #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MAITLAND_Rent_W_Conc_Res = MAITLAND_Rent_WO_Conc_Res*Rent_Factor_Open #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MAITLAND_GARDEN_VILLAGE_Rent_W_Conc_Res = MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res*Rent_Factor_Open #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MOUILLE_POINT_Rent_W_Conc_Res = MOUILLE_POINT_Rent_WO_Conc_Res*Rent_Factor_Open #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MOWBRAY_Rent_W_Conc_Res = MOWBRAY_Rent_WO_Conc_Res*Rent_Factor_Open #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 OBSERVATORY_Rent_W_Conc_Res = OBSERVATORY_Rent_WO_Conc_Res*Rent_Factor_Open #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ORANJEZICHT_Rent_W_Conc_Res = ORANJEZICHT_Rent_WO_Conc_Res*Rent_Factor_Open #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 PAARDEN_EILAND_Rent_W_Conc_Res = PAARDEN_EILAND_Rent_WO_Conc_Res*Rent_Factor_Open #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 RONDEBOSCH_Rent_W_Conc_Res = RONDEBOSCH_Rent_WO_Conc_Res*Rent_Factor_Open #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ROSEBANK_Rent_W_Conc_Res = ROSEBANK_Rent_WO_Conc_Res*Rent_Factor_Open #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SALT_RIVER_Rent_W_Conc_Res = SALT_RIVER_Rent_WO_Conc_Res*Rent_Factor_Open #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SCHOTSCHEKLOOF_Rent_W_Conc_Res = SCHOTSCHEKLOOF_Rent_WO_Conc_Res*Rent_Factor_Open #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SEA_POINT_Rent_W_Conc_Res = SEA_POINT_Rent_WO_Conc_Res*Rent_Factor_Open #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 TAMBOERSKLOOF_Rent_W_Conc_Res = TAMBOERSKLOOF_Rent_WO_Conc_Res*Rent_Factor_Open #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 THREE_ANCHOR_BAY_Rent_W_Conc_Res = THREE_ANCHOR_BAY_Rent_WO_Conc_Res*Rent_Factor_Open #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 VREDEHOEK_Rent_W_Conc_Res = VREDEHOEK_Rent_WO_Conc_Res*Rent_Factor_Open #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 WOODSTOCK_Rent_W_Conc_Res = WOODSTOCK_Rent_WO_Conc_Res*Rent_Factor_Open #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ZONNEBLOEM_Rent_W_Conc_Res = ZONNEBLOEM_Rent_WO_Conc_Res*Rent_Factor_Open #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

#Suburb Low-Income Residential Rent Price per m2

BANTRY_BAY_Rent_Low_Res = BANTRY_BAY_Rent_WO_Conc_Res*Rent_Factor_Low #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 BROOKLYN_Rent_Low_Res = BROOKLYN_Rent_WO_Conc_Res*Rent_Factor_Low #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 CAPE_TOWN_CITY_CENTRE_Rent_Low_Res = CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res*Rent_Factor_Low #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 FORESHORE_Rent_Low_Res = FORESHORE_Rent_WO_Conc_Res*Rent_Factor_Low #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 FRESNAYE_Rent_Low_Res = FRESNAYE_Rent_WO_Conc_Res*Rent_Factor_Low #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 GARDENS_Rent_Low_Res = GARDENS_Rent_WO_Conc_Res*Rent_Factor_Low #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 GREEN_POINT_Rent_Low_Res = GREEN_POINT_Rent_WO_Conc_Res*Rent_Factor_Low #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MAITLAND_Rent_Low_Res = MAITLAND_Rent_WO_Conc_Res*Rent_Factor_Low #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MAITLAND_GARDEN_VILLAGE_Rent_Low_Res = MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res*Rent_Factor_Low #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MOUILLE_POINT_Rent_Low_Res = MOUILLE_POINT_Rent_WO_Conc_Res*Rent_Factor_Low #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MOWBRAY_Rent_Low_Res = MOWBRAY_Rent_WO_Conc_Res*Rent_Factor_Low #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 OBSERVATORY_Rent_Low_Res = OBSERVATORY_Rent_WO_Conc_Res*Rent_Factor_Low #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ORANJEZICHT_Rent_Low_Res = ORANJEZICHT_Rent_WO_Conc_Res*Rent_Factor_Low #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 PAARDEN_EILAND_Rent_Low_Res = PAARDEN_EILAND_Rent_WO_Conc_Res*Rent_Factor_Low #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 RONDEBOSCH_Rent_Low_Res = RONDEBOSCH_Rent_WO_Conc_Res*Rent_Factor_Low #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ROSEBANK_Rent_Low_Res = ROSEBANK_Rent_WO_Conc_Res*Rent_Factor_Low #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SALT_RIVER_Rent_Low_Res = SALT_RIVER_Rent_WO_Conc_Res*Rent_Factor_Low #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SCHOTSCHERKLOOF_Rent_Low_Res = SCHOTSCHERKLOOF_Rent_WO_Conc_Res*Rent_Factor_Low #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SEA_POINT_Rent_Low_Res = SEA_POINT_Rent_WO_Conc_Res*Rent_Factor_Low #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 TAMBOERSKLOOF_Rent_Low_Res = TAMBOERSKLOOF_Rent_WO_Conc_Res*Rent_Factor_Low #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 THREE_ANCHOR_BAY_Rent_Low_Res = THREE_ANCHOR_BAY_Rent_WO_Conc_Res*Rent_Factor_Low #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 VREDEHOEK_Rent_Low_Res = VREDEHOEK_Rent_WO_Conc_Res*Rent_Factor_Low #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 WOODSTOCK_Rent_Low_Res = WOODSTOCK_Rent_WO_Conc_Res*Rent_Factor_Low #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ZONNEBLOEM_Rent_Low_Res = ZONNEBLOEM_Rent_WO_Conc_Res*Rent_Factor_Low #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

#Suburb Med-Income Residential Rent Price per m2

BANTRY_BAY_Rent_Med_Res = BANTRY_BAY_Rent_WO_Conc_Res*Rent_Factor_Med #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 BROOKLYN_Rent_Med_Res = BROOKLYN_Rent_WO_Conc_Res*Rent_Factor_Med #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 CAPE_TOWN_CITY_CENTRE_Rent_Med_Res = CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res*Rent_Factor_Med #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 FORESHORE_Rent_Med_Res = FORESHORE_Rent_WO_Conc_Res*Rent_Factor_Med #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 FRESNAYE_Rent_Med_Res = FRESNAYE_Rent_WO_Conc_Res*Rent_Factor_Med #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 GARDENS_Rent_Med_Res = GARDENS_Rent_WO_Conc_Res*Rent_Factor_Med #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 GREEN_POINT_Rent_Med_Res = GREEN_POINT_Rent_WO_Conc_Res*Rent_Factor_Med #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MAITLAND_Rent_Med_Res = MAITLAND_Rent_WO_Conc_Res*Rent_Factor_Med #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

MAITLAND_GARDEN_VILLAGE_Rent_Med_Res = MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res*Rent_Factor_Med #Northern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

MOUILLE_POINT_Rent_Med_Res = MOUILLE_POINT_Rent_WO_Conc_Res*Rent_Factor_Med #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

MOWBRAY_Rent_Med_Res = MOWBRAY_Rent_WO_Conc_Res*Rent_Factor_Med #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

OBSERVATORY_Rent_Med_Res = OBSERVATORY_Rent_WO_Conc_Res*Rent_Factor_Med #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

ORANJEZICHT_Rent_Med_Res = ORANJEZICHT_Rent_WO_Conc_Res*Rent_Factor_Med #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

PAARDEN_EILAND_Rent_Med_Res = PAARDEN_EILAND_Rent_WO_Conc_Res*Rent_Factor_Med #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

RONDEBOSCH_Rent_Med_Res = RONDEBOSCH_Rent_WO_Conc_Res*Rent_Factor_Med #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

ROSEBANK_Rent_Med_Res = ROSEBANK_Rent_WO_Conc_Res*Rent_Factor_Med #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

SALT_RIVER_Rent_Med_Res = SALT_RIVER_Rent_WO_Conc_Res*Rent_Factor_Med #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

SCHOTSCHERKLOOF_Rent_Med_Res = SCHOTSCHERKLOOF_Rent_WO_Conc_Res*Rent_Factor_Med #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

SEA_POINT_Rent_Med_Res = SEA_POINT_Rent_WO_Conc_Res*Rent_Factor_Med #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

TAMBOERSKLOOF_Rent_Med_Res = TAMBOERSKLOOF_Rent_WO_Conc_Res*Rent_Factor_Med #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

THREE_ANCHOR_BAY_Rent_Med_Res = THREE_ANCHOR_BAY_Rent_WO_Conc_Res*Rent_Factor_Med #Atlantic Seaboard 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

VREDEHOEK_Rent_Med_Res = VREDEHOEK_Rent_WO_Conc_Res*Rent_Factor_Med #City Bowl 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

WOODSTOCK_Rent_Med_Res = WOODSTOCK_Rent_WO_Conc_Res*Rent_Factor_Med #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

ZONNEBLOEM_Rent_Med_Res = ZONNEBLOEM_Rent_WO_Conc_Res*Rent_Factor_Med #Southern Suburbs 2011 multiplied by low income rent factor <https://ctproperty.weebly.com/rental-returns-on-property.html>

#Suburb Office Rent Price per m2

BANTRY_BAY_Rent_Office = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

BROOKLYN_Rent_Office = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

##CAPE_TOWN_CITY_CENTRE_Rent_Office = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

CAPE_TOWN_CITY_CENTRE_Rent_Office = 231.00 #Property24 Est per m2

FORESHORE_Rent_Office = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

FRESNAYE_Rent_Office = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

GARDENS_Rent_Office = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

GREEN_POINT_Rent_Office = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

##MAITLAND_Rent_Office = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

MAITLAND_Rent_Office = 131.00 #Property24 Est per m2

MAITLAND_GARDEN_VILLAGE_Rent_Office = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

MOUILLE_POINT_Rent_Office = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

MOWBRAY_Rent_Office = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

##OBSERVATORY_Rent_Office = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

OBSERVATORY_Rent_Office = 210.0 #Property24 Est per m2

ORANJEZICHT_Rent_Office = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

PAARDEN_EILAND_Rent_Office = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

RONDEBOSCH_Rent_Office = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

ROSEBANK_Rent_Office = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

SALT_RIVER_Rent_Office = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

SCHOTSCHERKLOOF_Rent_Office = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

##SEA_POINT_Rent_Office = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

SEA_POINT_Rent_Office = 187.0 #Property24 Est per m2

TAMBOERSKLOOF_Rent_Office = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

THREE_ANCHOR_BAY_Rent_Office = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

VREDEHOEK_Rent_Office = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

WOODSTOCK_Rent_Office = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

##ZONNEBLOEM_Rent_Office = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>

ZONNEBLOEM_Rent_Office = 198.00 #Property24 Est per m2

#Suburb Retail Rent Price per m2

BANTRY_BAY_Rent_Retail = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 BROOKLYN_Rent_Retail = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ##CAPE_TOWN_CITY_CENTRE_Rent_Retail = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 CAPE_TOWN_CITY_CENTRE_Rent_Retail = 231.0 #Property24 Est per m2
 FORESHORE_Rent_Retail = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 FRESNAYE_Rent_Retail = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 GARDENS_Rent_Retail = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 GREEN_POINT_Rent_Retail = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ##MAITLAND_Rent_Retail = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MAITLAND_Rent_Retail = 131.0 #Property24 Est per m2
 MAITLAND_GARDEN_VILLAGE_Rent_Retail = 56.0 #Northern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MOUILLE_POINT_Rent_Retail = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 MOWBRAY_Rent_Retail = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 OBSERVATORY_Rent_Retail = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 OBSERVATORY_Rent_Retail = 210.0 #Property24 Est per m2
 ##ORANJEZICHT_Rent_Retail = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 PAARDEN_EILAND_Rent_Retail = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 RONDEBOSCH_Rent_Retail = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ROSEBANK_Rent_Retail = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SALT_RIVER_Rent_Retail = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SCHOTSCHEKLOOF_Rent_Retail = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ##SEA_POINT_Rent_Retail = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 SEA_POINT_Rent_Retail = 187.0 #Property24 Est per m2
 TAMBOERSKLOOF_Rent_Retail = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 THREE_ANCHOR_BAY_Rent_Retail = 133.0 #Atlantic Seaboard 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 VREDEHOEK_Rent_Retail = 133.0 #City Bowl 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 WOODSTOCK_Rent_Retail = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ##ZONNEBLOEM_Rent_Retail = 85.0 #Southern Suburbs 2011 <https://ctproperty.weebly.com/rental-returns-on-property.html>
 ZONNEBLOEM_Rent_Retail = 198.0 #Property24 Est per m2

#Suburb Parking Without Concessions Price per m2

BANTRY_BAY_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 BROOKLYN_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 CAPE_TOWN_CITY_CENTRE_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 ##CAPE_TOWN_CITY_CENTRE_Rent_Parking_WO_Conc = 11.0 #2011 estimate
 FORESHORE_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 FRESNAYE_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 GARDENS_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 GREEN_POINT_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 MAITLAND_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 ##MAITLAND_Rent_Parking_WO_Conc = 11.0 #2011 estimate
 MAITLAND_GARDEN_VILLAGE_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 MOUILLE_POINT_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 MOWBRAY_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 OBSERVATORY_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 ##OBSERVATORY_Rent_Parking_WO_Conc = 11.0 #2011 estimate
 ORANJEZICHT_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 PAARDEN_EILAND_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 RONDEBOSCH_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 ROSEBANK_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 SALT_RIVER_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 SCHOTSCHEKLOOF_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 SEA_POINT_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 ##SEA_POINT_Rent_Parking_WO_Conc = 11.0 #2011 estimate
 TAMBOERSKLOOF_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 THREE_ANCHOR_BAY_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 VREDEHOEK_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 WOODSTOCK_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 ZONNEBLOEM_Rent_Parking_WO_Conc = 17.5 #2018 estimate
 ##ZONNEBLOEM_Rent_Parking_WO_Conc = 11.0 #2011 estimate

#Suburb Parking With Conc Rent Price per m2

BANTRY_BAY_Rent_Parking_W_Conc = 25.0 #2018 estimate
 BROOKLYN_Rent_Parking_W_Conc = 25.0 #2018 estimate
 CAPE_TOWN_CITY_CENTRE_Rent_Parking_W_Conc = 25.0 #2018 estimate

##CAPE_TOWN_CITY_CENTRE_Rent_Parking_W_Conc = 16.0 #2011 estimate
 FORESHORE_Rent_Parking_W_Conc = 25.0 #2018 estimate
 FRESNAYE_Rent_Parking_W_Conc = 25.0 #2018 estimate
 GARDENS_Rent_Parking_W_Conc = 25.0 #2018 estimate
 GREEN_POINT_Rent_Parking_W_Conc = 25.0 #2018 estimate
 MAITLAND_Rent_Parking_W_Conc = 25.0 #2018 estimate
 ##MAITLAND_Rent_Parking_W_Conc = 16.0 #2011 estimate
 MAITLAND_GARDEN_VILLAGE_Rent_Parking_W_Conc = 25.0 #2018 estimate
 MOUILLE_POINT_Rent_Parking_W_Conc = 25.0 #2018 estimate
 MOWBRAY_Rent_Parking_W_Conc= 25.0 #2018 estimate
 OBSERVATORY_Rent_Parking_W_Conc = 25.0 #2018 estimate
 ##OBSERVATORY_Rent_Parking_W_Conc = 16.0 #2011 estimate
 ORANJEZICHT_Rent_Parking_W_Conc = 25.0 #2018 estimate
 PAARDEN_EILAND_Rent_Parking_W_Conc = 25.0 #2018 estimate
 RONDEBOSCH_Rent_Parking_W_Conc = 25.0 #2018 estimate
 ROSEBANK_Rent_Parking_W_Conc = 25.0 #2018 estimate
 SALT_RIVER_Rent_Parking_W_Conc = 25.0 #2018 estimate
 SCHOTSCHEKLOOF_Rent_Parking_W_Conc = 25.0 #2018 estimate
 SEA_POINT_Rent_Parking_W_Conc = 25.0 #2018 estimate
 ##SEA_POINT_Rent_Parking_W_Conc = 16.0 #2011 estimate
 TAMBOERSKLOOF_Rent_Parking_W_Conc = 25.0 #2018 estimate
 THREE_ANCHOR_BAY_Rent_Parking_W_Conc = 25.0 #2018 estimate
 VREDEHOEK_Rent_Parking_W_Conc = 25.0 #2018 estimate
 WOODSTOCK_Rent_Parking_W_Conc = 25.0 #2018 estimate
 ZONNEBLOEM_Rent_Parking_W_Conc = 25.0 #2018 estimate
 ##ZONNEBLOEM_Rent_Parking_W_Conc = 16.0 #2011 estimate

#Suburb Parking Without Concessions Sale Price per m2 (30m2 per bay incl manouvre space)

BANTRY_BAY_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 BROOKLYN_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 CAPE_TOWN_CITY_CENTRE_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 ##CAPE_TOWN_CITY_CENTRE_Sale_Parking_WO_Conc = 3100.0 #2011 estimate
 FORESHORE_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 FRESNAYE_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 GARDENS_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 GREEN_POINT_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 MAITLAND_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 ##MAITLAND_Sale_Parking_WO_Conc = 3100.0 #2011 estimate
 MAITLAND_GARDEN_VILLAGE_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 MOUILLE_POINT_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 MOWBRAY_Sale_Parking_WO_Conc= 5000.0 #2018 estimate
 OBSERVATORY_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 ##OBSERVATORY_Sale_Parking_WO_Conc = 3100.0 #2011 estimate
 ORANJEZICHT_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 PAARDEN_EILAND_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 RONDEBOSCH_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 ROSEBANK_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 SALT_RIVER_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 SCHOTSCHEKLOOF_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 SEA_POINT_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 ##SEA_POINT_Sale_Parking_WO_Conc = 3100.0 #2011 estimate
 TAMBOERSKLOOF_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 THREE_ANCHOR_BAY_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 VREDEHOEK_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 WOODSTOCK_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 ZONNEBLOEM_Sale_Parking_WO_Conc = 5000.0 #2018 estimate
 ##ZONNEBLOEM_Sale_Parking_WO_Conc = 3100.0 #2011 estimate

#Suburb Parking With Concession Sale Price per m2 (30m2 per bay incl manouvre space)

BANTRY_BAY_Sale_Parking_W_Conc = 6500.0 #2018 estimate
 BROOKLYN_Sale_Parking_W_Conc = 6500.0 #2018 estimate
 CAPE_TOWN_CITY_CENTRE_Sale_Parking_W_Conc = 6500.0 #2018 estimate
 ##CAPE_TOWN_CITY_CENTRE_Sale_Parking_W_Conc = 4000.0 #2011 estimate
 FORESHORE_Sale_Parking_W_Conc = 6500.0 #2018 estimate
 FRESNAYE_Sale_Parking_W_Conc = 6500.0 #2018 estimate
 GARDENS_Sale_Parking_W_Conc = 6500.0 #2018 estimate

GREEN_POINT_Sale_Parking_W_Conc = 6500.0 #2018 estimate
MAITLAND_Sale_Parking_W_Conc = 6500.0 #2018 estimate
##MAITLAND_Sale_Parking_W_Conc = 4000.0 #2011 estimate
MAITLAND_GARDEN_VILLAGE_Sale_Parking_W_Conc = 6500.0 #2018 estimate
MOUILLE_POINT_Sale_Parking_W_Conc = 6500.0 #2018 estimate
MOWBRAY_Sale_Parking_W_Conc = 6500.0 #2018 estimate
OBSERVATORY_Sale_Parking_W_Conc = 6500.0 #2018 estimate
##OBSERVATORY_Sale_Parking_W_Conc = 4000.0 #2011 estimate
ORANJEZICHT_Sale_Parking_W_Conc = 6500.0 #2018 estimate
PAARDEN_EILAND_Sale_Parking_W_Conc = 6500.0 #2018 estimate
RONDEBOSCH_Sale_Parking_W_Conc = 6500.0 #2018 estimate
ROSEBANK_Sale_Parking_W_Conc = 6500.0 #2018 estimate
SALT_RIVER_Sale_Parking_W_Conc = 6500.0 #2018 estimate
SCHOTSCHEKLOOF_Sale_Parking_W_Conc = 6500.0 #2018 estimate
SEA_POINT_Sale_Parking_W_Conc = 6500.0 #2018 estimate
##SEA_POINT_Sale_Parking_W_Conc = 4000.0 #2011 estimate
TAMBOERSKLOOF_Sale_Parking_W_Conc = 6500.0 #2018 estimate
THREE_ANCHOR_BAY_Sale_Parking_W_Conc = 6500.0 #2018 estimate
VREDEHOEK_Sale_Parking_W_Conc = 6500.0 #2018 estimate
WOODSTOCK_Sale_Parking_W_Conc = 6500.0 #2018 estimate
ZONNEBLOEM_Sale_Parking_W_Conc = 6500.0 #2018 estimate
##ZONNEBLOEM_Sale_Parking_W_Conc = 4000.0 #2011 estimate

Module D – Initial Site Calculations

```
def main():
    pass

if __name__ == '__main__':
    main()

from Site_Configs_v2 import*
from Suburb_Data_v1 import*
from Raster_Data_Extract_v1 import*
#from Calculations_Floor_Area_v1 import*

#Land Parcel Size
Parcel_Size_1 = Parcel_Count_1*Raster_Cell_Size
Parcel_Size_2 = Parcel_Count_2*Raster_Cell_Size
Parcel_Size_3 = Parcel_Count_3*Raster_Cell_Size
Parcel_Size_4 = Parcel_Count_4*Raster_Cell_Size
Parcel_Size_5 = Parcel_Count_5*Raster_Cell_Size

#Land Parcel 1 Vacant Land Price
if Parcel_Suburb_1 == BANTRY_BAY:
    Parcel_Land_1 = BANTRY_BAY_Land
    Parcel_WO_Conc_Sale_1 = BANTRY_BAY_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = BANTRY_BAY_W_Conc_Sale
    Parcel_Muni_1 = BANTRY_BAY_Muni
    Parcel_Rent_WO_Conc_Res_1 = BANTRY_BAY_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = BANTRY_BAY_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = BANTRY_BAY_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = BANTRY_BAY_Rent_Med_Res
    Parcel_Rent_Office_1 = BANTRY_BAY_Rent_Office
    Parcel_Rent_Retail_1 = BANTRY_BAY_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = BANTRY_BAY_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = BANTRY_BAY_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = BANTRY_BAY_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = BANTRY_BAY_Sale_Parking_W_Conc
    Suburb_Name_1 = "BANTRY_BAY"
elif Parcel_Suburb_1 == BROOKLYN:
    Parcel_Land_1 = BROOKLYN_Land
    Parcel_WO_Conc_Sale_1 = BROOKLYN_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = BROOKLYN_W_Conc_Sale
    Parcel_Muni_1 = BROOKLYN_Muni
    Parcel_Rent_WO_Conc_Res_1 = BROOKLYN_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = BROOKLYN_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = BROOKLYN_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = BROOKLYN_Rent_Med_Res
    Parcel_Rent_Office_1 = BROOKLYN_Rent_Office
    Parcel_Rent_Retail_1 = BROOKLYN_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = BROOKLYN_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = BROOKLYN_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = BROOKLYN_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = BROOKLYN_Sale_Parking_W_Conc
    Suburb_Name_1 = "BROOKLYN"
elif Parcel_Suburb_1 == CAPE_TOWN_CITY_CENTRE:
    Parcel_Land_1 = CAPE_TOWN_CITY_CENTRE_Land
    Parcel_WO_Conc_Sale_1 = CAPE_TOWN_CITY_CENTRE_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = CAPE_TOWN_CITY_CENTRE_W_Conc_Sale
    Parcel_Muni_1 = CAPE_TOWN_CITY_CENTRE_Muni
    Parcel_Rent_WO_Conc_Res_1 = CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = CAPE_TOWN_CITY_CENTRE_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = CAPE_TOWN_CITY_CENTRE_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = CAPE_TOWN_CITY_CENTRE_Rent_Med_Res
    Parcel_Rent_Office_1 = CAPE_TOWN_CITY_CENTRE_Rent_Office
    Parcel_Rent_Retail_1 = CAPE_TOWN_CITY_CENTRE_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_WO_Conc
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Parcel_Rent_Parking_W_Conc_1 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_W_Conc
Suburb_Name_1 = "CAPE_TOWN_CITY_CENTRE"
elif Parcel_Suburb_1 == FORESHORE:
    Parcel_Land_1 = FORESHORE_Land
    Parcel_WO_Conc_Sale_1 = FORESHORE_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = FORESHORE_W_Conc_Sale
    Parcel_Muni_1 = FORESHORE_Muni
    Parcel_Rent_WO_Conc_Res_1 = FORESHORE_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = FORESHORE_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = FORESHORE_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = FORESHORE_Rent_Med_Res
    Parcel_Rent_Office_1 = FORESHORE_Rent_Office
    Parcel_Rent_Retail_1 = FORESHORE_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = FORESHORE_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = FORESHORE_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = FORESHORE_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = FORESHORE_Sale_Parking_W_Conc
    Suburb_Name_1 = "FORESHORE"
elif Parcel_Suburb_1 == FRESNAYE:
    Parcel_Land_1 = FRESNAYE_Land
    Parcel_WO_Conc_Sale_1 = FRESNAYE_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = FRESNAYE_W_Conc_Sale
    Parcel_Muni_1 = FRESNAYE_Muni
    Parcel_Rent_WO_Conc_Res_1 = FRESNAYE_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = FRESNAYE_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = FRESNAYE_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = FRESNAYE_Rent_Med_Res
    Parcel_Rent_Office_1 = FRESNAYE_Rent_Office
    Parcel_Rent_Retail_1 = FRESNAYE_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = FRESNAYE_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = FRESNAYE_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = FRESNAYE_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = FRESNAYE_Sale_Parking_W_Conc
    Suburb_Name_1 = "FRESNAYE"
elif Parcel_Suburb_1 == GARDENS:
    Parcel_Land_1 = GARDENS_Land
    Parcel_WO_Conc_Sale_1 = GARDENS_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = GARDENS_W_Conc_Sale
    Parcel_Muni_1 = GARDENS_Muni
    Parcel_Rent_WO_Conc_Res_1 = GARDENS_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = GARDENS_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = GARDENS_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = GARDENS_Rent_Med_Res
    Parcel_Rent_Office_1 = GARDENS_Rent_Office
    Parcel_Rent_Retail_1 = GARDENS_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = GARDENS_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = GARDENS_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = GARDENS_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = GARDENS_Sale_Parking_W_Conc
    Suburb_Name_1 = "GARDENS"
elif Parcel_Suburb_1 == GREEN_POINT:
    Parcel_Land_1 = GREEN_POINT_Land
    Parcel_WO_Conc_Sale_1 = GREEN_POINT_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = GREEN_POINT_W_Conc_Sale
    Parcel_Muni_1 = GREEN_POINT_Muni
    Parcel_Rent_WO_Conc_Res_1 = GREEN_POINT_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = GREEN_POINT_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = GREEN_POINT_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = GREEN_POINT_Rent_Med_Res
    Parcel_Rent_Office_1 = GREEN_POINT_Rent_Office
    Parcel_Rent_Retail_1 = GREEN_POINT_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = GREEN_POINT_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = GREEN_POINT_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = GREEN_POINT_Sale_Parking_WO_Conc

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Parcel_Sale_Parking_W_Conc_1 = GREEN_POINT_Sale_Parking_W_Conc
Suburb_Name_1 = "GREEN_POINT"
elif Parcel_Suburb_1 == MAITLAND:
Parcel_Land_1 = MAITLAND_Land
Parcel_WO_Conc_Sale_1 = MAITLAND_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = MAITLAND_W_Conc_Sale
Parcel_Muni_1 = MAITLAND_Muni
Parcel_Rent_WO_Conc_Res_1 = MAITLAND_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = MAITLAND_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = MAITLAND_Rent_Low_Res
Parcel_Rent_Med_Res_1 = MAITLAND_Rent_Med_Res
Parcel_Rent_Office_1 = MAITLAND_Rent_Office
Parcel_Rent_Retail_1 = MAITLAND_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = MAITLAND_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = MAITLAND_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = MAITLAND_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = MAITLAND_Sale_Parking_W_Conc
Suburb_Name_1 = "MAITLAND"
elif Parcel_Suburb_1 == MAITLAND_GARDEN_VILLAGE:
Parcel_Land_1 = MAITLAND_GARDEN_VILLAGE_Land
Parcel_WO_Conc_Sale_1 = MAITLAND_GARDEN_VILLAGE_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = MAITLAND_GARDEN_VILLAGE_W_Conc_Sale
Parcel_Muni_1 = MAITLAND_GARDEN_VILLAGE_Muni
Parcel_Rent_WO_Conc_Res_1 = MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = MAITLAND_GARDEN_VILLAGE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = MAITLAND_GARDEN_VILLAGE_Rent_Low_Res
Parcel_Rent_Med_Res_1 = MAITLAND_GARDEN_VILLAGE_Rent_Med_Res
Parcel_Rent_Office_1 = MAITLAND_GARDEN_VILLAGE_Rent_Office
Parcel_Rent_Retail_1 = MAITLAND_GARDEN_VILLAGE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_W_Conc
Suburb_Name_1 = "MAITLAND_GARDEN_VILLAGE"
elif Parcel_Suburb_1 == MOUILLE_POINT:
Parcel_Land_1 = MOUILLE_POINT_Land
Parcel_WO_Conc_Sale_1 = MOUILLE_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = MOUILLE_POINT_W_Conc_Sale
Parcel_Muni_1 = MOUILLE_POINT_Muni
Parcel_Rent_WO_Conc_Res_1 = MOUILLE_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = MOUILLE_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = MOUILLE_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_1 = MOUILLE_POINT_Rent_Med_Res
Parcel_Rent_Office_1 = MOUILLE_POINT_Rent_Office
Parcel_Rent_Retail_1 = MOUILLE_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = MOUILLE_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = MOUILLE_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = MOUILLE_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = MOUILLE_POINT_Sale_Parking_W_Conc
Suburb_Name_1 = "MOUILLE_POINT"
elif Parcel_Suburb_1 == MOWBRAY:
Parcel_Land_1 = MOWBRAY_Land
Parcel_WO_Conc_Sale_1 = MOWBRAY_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = MOWBRAY_W_Conc_Sale
Parcel_Muni_1 = MOWBRAY_Muni
Parcel_Rent_WO_Conc_Res_1 = MOWBRAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = MOWBRAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = MOWBRAY_Rent_Low_Res
Parcel_Rent_Med_Res_1 = MOWBRAY_Rent_Med_Res
Parcel_Rent_Office_1 = MOWBRAY_Rent_Office
Parcel_Rent_Retail_1 = MOWBRAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = MOWBRAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = MOWBRAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = MOWBRAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = MOWBRAY_Sale_Parking_W_Conc
Suburb_Name_1 = "MOWBRAY"

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elif Parcel_Suburb_1 == OBSERVATORY:
    Parcel_Land_1 = OBSERVATORY_Land
    Parcel_WO_Conc_Sale_1 = OBSERVATORY_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = OBSERVATORY_W_Conc_Sale
    Parcel_Muni_1 = OBSERVATORY_Muni
    Parcel_Rent_WO_Conc_Res_1 = OBSERVATORY_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = OBSERVATORY_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = OBSERVATORY_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = OBSERVATORY_Rent_Med_Res
    Parcel_Rent_Office_1 = OBSERVATORY_Rent_Office
    Parcel_Rent_Retail_1 = OBSERVATORY_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = OBSERVATORY_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = OBSERVATORY_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = OBSERVATORY_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = OBSERVATORY_Sale_Parking_W_Conc
    Suburb_Name_1 = "OBSERVATORY"
elif Parcel_Suburb_1 == ORANJEZICHT:
    Parcel_Land_1 = ORANJEZICHT_Land
    Parcel_WO_Conc_Sale_1 = ORANJEZICHT_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = ORANJEZICHT_W_Conc_Sale
    Parcel_Muni_1 = ORANJEZICHT_Muni
    Parcel_Rent_WO_Conc_Res_1 = ORANJEZICHT_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = ORANJEZICHT_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = ORANJEZICHT_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = ORANJEZICHT_Rent_Med_Res
    Parcel_Rent_Office_1 = ORANJEZICHT_Rent_Office
    Parcel_Rent_Retail_1 = ORANJEZICHT_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = ORANJEZICHT_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = ORANJEZICHT_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = ORANJEZICHT_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = ORANJEZICHT_Sale_Parking_W_Conc
    Suburb_Name_1 = "ORANJEZICHT"
elif Parcel_Suburb_1 == PAARDEN_EILAND:
    Parcel_Land_1 = PAARDEN_EILAND_Land
    Parcel_WO_Conc_Sale_1 = PAARDEN_EILAND_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = PAARDEN_EILAND_W_Conc_Sale
    Parcel_Muni_1 = PAARDEN_EILAND_Muni
    Parcel_Rent_WO_Conc_Res_1 = PAARDEN_EILAND_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = PAARDEN_EILAND_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = PAARDEN_EILAND_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = PAARDEN_EILAND_Rent_Med_Res
    Parcel_Rent_Office_1 = PAARDEN_EILAND_Rent_Office
    Parcel_Rent_Retail_1 = PAARDEN_EILAND_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = PAARDEN_EILAND_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = PAARDEN_EILAND_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = PAARDEN_EILAND_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = PAARDEN_EILAND_Sale_Parking_W_Conc
    Suburb_Name_1 = "PAARDEN_EILAND"
elif Parcel_Suburb_1 == RONDEBOSCH:
    Parcel_Land_1 = RONDEBOSCH_Land
    Parcel_WO_Conc_Sale_1 = RONDEBOSCH_WO_Conc_Sale
    Parcel_W_Conc_Sale_1 = RONDEBOSCH_W_Conc_Sale
    Parcel_Muni_1 = RONDEBOSCH_Muni
    Parcel_Rent_WO_Conc_Res_1 = RONDEBOSCH_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_1 = RONDEBOSCH_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_1 = RONDEBOSCH_Rent_Low_Res
    Parcel_Rent_Med_Res_1 = RONDEBOSCH_Rent_Med_Res
    Parcel_Rent_Office_1 = RONDEBOSCH_Rent_Office
    Parcel_Rent_Retail_1 = RONDEBOSCH_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_1 = RONDEBOSCH_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_1 = RONDEBOSCH_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_1 = RONDEBOSCH_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_1 = RONDEBOSCH_Sale_Parking_W_Conc
    Suburb_Name_1 = "RONDEBOSCH"
elif Parcel_Suburb_1 == ROSEBANK:
    Parcel_Land_1 = ROSEBANK_Land

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Parcel_WO_Conc_Sale_1 = ROSEBANK_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = ROSEBANK_W_Conc_Sale
Parcel_Muni_1 = ROSEBANK_Muni
Parcel_Rent_WO_Conc_Res_1 = ROSEBANK_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = ROSEBANK_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = ROSEBANK_Rent_Low_Res
Parcel_Rent_Med_Res_1 = ROSEBANK_Rent_Med_Res
Parcel_Rent_Office_1 = ROSEBANK_Rent_Office
Parcel_Rent_Retail_1 = ROSEBANK_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = ROSEBANK_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = ROSEBANK_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = ROSEBANK_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = ROSEBANK_Sale_Parking_W_Conc
Suburb_Name_1 = "ROSEBANK"
elif Parcel_Suburb_1 == SALT_RIVER:
Parcel_Land_1 = SALT_RIVER_Land
Parcel_WO_Conc_Sale_1 = SALT_RIVER_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = SALT_RIVER_W_Conc_Sale
Parcel_Muni_1 = SALT_RIVER_Muni
Parcel_Rent_WO_Conc_Res_1 = SALT_RIVER_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = SALT_RIVER_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = SALT_RIVER_Rent_Low_Res
Parcel_Rent_Med_Res_1 = SALT_RIVER_Rent_Med_Res
Parcel_Rent_Office_1 = SALT_RIVER_Rent_Office
Parcel_Rent_Retail_1 = SALT_RIVER_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = SALT_RIVER_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = SALT_RIVER_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = SALT_RIVER_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = SALT_RIVER_Sale_Parking_W_Conc
Suburb_Name_1 = "SALT_RIVER"
elif Parcel_Suburb_1 == SCHOTSCHEKLOOF:
Parcel_Land_1 = SCHOTSCHEKLOOF_Land
Parcel_WO_Conc_Sale_1 = SCHOTSCHEKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = SCHOTSCHEKLOOF_W_Conc_Sale
Parcel_Muni_1 = SCHOTSCHEKLOOF_Muni
Parcel_Rent_WO_Conc_Res_1 = SCHOTSCHEKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = SCHOTSCHEKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = SCHOTSCHEKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_1 = SCHOTSCHEKLOOF_Rent_Med_Res
Parcel_Rent_Office_1 = SCHOTSCHEKLOOF_Rent_Office
Parcel_Rent_Retail_1 = SCHOTSCHEKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = SCHOTSCHEKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = SCHOTSCHEKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = SCHOTSCHEKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = SCHOTSCHEKLOOF_Sale_Parking_W_Conc
Suburb_Name_1 = "SCHOTSCHEKLOOF"
elif Parcel_Suburb_1 == SEA_POINT:
Parcel_Land_1 = SEA_POINT_Land
Parcel_WO_Conc_Sale_1 = SEA_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = SEA_POINT_W_Conc_Sale
Parcel_Muni_1 = SEA_POINT_Muni
Parcel_Rent_WO_Conc_Res_1 = SEA_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = SEA_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = SEA_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_1 = SEA_POINT_Rent_Med_Res
Parcel_Rent_Office_1 = SEA_POINT_Rent_Office
Parcel_Rent_Retail_1 = SEA_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = SEA_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = SEA_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = SEA_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = SEA_POINT_Sale_Parking_W_Conc
Suburb_Name_1 = "SEA_POINT"
elif Parcel_Suburb_1 == TAMBOERSKLOOF:
Parcel_Land_1 = TAMBOERSKLOOF_Land
Parcel_WO_Conc_Sale_1 = TAMBOERSKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = TAMBOERSKLOOF_W_Conc_Sale

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Parcel_Muni_1 = TAMBOERSKLOOF_Muni
Parcel_Rent_WO_Conc_Res_1 = TAMBOERSKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = TAMBOERSKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = TAMBOERSKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_1 = TAMBOERSKLOOF_Rent_Med_Res
Parcel_Rent_Office_1 = TAMBOERSKLOOF_Rent_Office
Parcel_Rent_Retail_1 = TAMBOERSKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = TAMBOERSKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = TAMBOERSKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = TAMBOERSKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = TAMBOERSKLOOF_Sale_Parking_W_Conc
Suburb_Name_1 = "TAMBOERSKLOOF"
elif Parcel_Suburb_1 == THREE_ANCHOR_BAY:
Parcel_Land_1 = THREE_ANCHOR_BAY_Land
Parcel_WO_Conc_Sale_1 = THREE_ANCHOR_BAY_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = THREE_ANCHOR_BAY_W_Conc_Sale
Parcel_Muni_1 = THREE_ANCHOR_BAY_Muni
Parcel_Rent_WO_Conc_Res_1 = THREE_ANCHOR_BAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = THREE_ANCHOR_BAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = THREE_ANCHOR_BAY_Rent_Low_Res
Parcel_Rent_Med_Res_1 = THREE_ANCHOR_BAY_Rent_Med_Res
Parcel_Rent_Office_1 = THREE_ANCHOR_BAY_Rent_Office
Parcel_Rent_Retail_1 = THREE_ANCHOR_BAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = THREE_ANCHOR_BAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = THREE_ANCHOR_BAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = THREE_ANCHOR_BAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = THREE_ANCHOR_BAY_Sale_Parking_W_Conc
Suburb_Name_1 = "THREE_ANCHOR_BAY"
elif Parcel_Suburb_1 == VREDEHOEK:
Parcel_Land_1 = VREDEHOEK_Land
Parcel_WO_Conc_Sale_1 = VREDEHOEK_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = VREDEHOEK_W_Conc_Sale
Parcel_Muni_1 = VREDEHOEK_Muni
Parcel_Rent_WO_Conc_Res_1 = VREDEHOEK_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = VREDEHOEK_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = VREDEHOEK_Rent_Low_Res
Parcel_Rent_Med_Res_1 = VREDEHOEK_Rent_Med_Res
Parcel_Rent_Office_1 = VREDEHOEK_Rent_Office
Parcel_Rent_Retail_1 = VREDEHOEK_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = VREDEHOEK_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = VREDEHOEK_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = VREDEHOEK_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = VREDEHOEK_Sale_Parking_W_Conc
Suburb_Name_1 = "VREDEHOEK"
elif Parcel_Suburb_1 == WOODSTOCK:
Parcel_Land_1 = WOODSTOCK_Land
Parcel_WO_Conc_Sale_1 = WOODSTOCK_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = WOODSTOCK_W_Conc_Sale
Parcel_Muni_1 = WOODSTOCK_Muni
Parcel_Rent_WO_Conc_Res_1 = WOODSTOCK_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_1 = WOODSTOCK_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = WOODSTOCK_Rent_Low_Res
Parcel_Rent_Med_Res_1 = WOODSTOCK_Rent_Med_Res
Parcel_Rent_Office_1 = WOODSTOCK_Rent_Office
Parcel_Rent_Retail_1 = WOODSTOCK_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = WOODSTOCK_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = WOODSTOCK_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = WOODSTOCK_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = WOODSTOCK_Sale_Parking_W_Conc
Suburb_Name_1 = "WOODSTOCK"
elif Parcel_Suburb_1 == ZONNEBLOEM:
Parcel_Land_1 = ZONNEBLOEM_Land
Parcel_WO_Conc_Sale_1 = ZONNEBLOEM_WO_Conc_Sale
Parcel_W_Conc_Sale_1 = ZONNEBLOEM_W_Conc_Sale
Parcel_Muni_1 = ZONNEBLOEM_Muni
Parcel_Rent_WO_Conc_Res_1 = ZONNEBLOEM_Rent_WO_Conc_Res

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Parcel_Rent_W_Conc_Res_1 = ZONNEBLOEM_Rent_W_Conc_Res
Parcel_Rent_Low_Res_1 = ZONNEBLOEM_Rent_Low_Res
Parcel_Rent_Med_Res_1 = ZONNEBLOEM_Rent_Med_Res
Parcel_Rent_Office_1 = ZONNEBLOEM_Rent_Office
Parcel_Rent_Retail_1 = ZONNEBLOEM_Rent_Retail
Parcel_Rent_Parking_WO_Conc_1 = ZONNEBLOEM_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_1 = ZONNEBLOEM_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_1 = ZONNEBLOEM_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_1 = ZONNEBLOEM_Sale_Parking_W_Conc
Suburb_Name_1 = "ZONNEBLOEM"
else:
    print 'Error Land Parcel 1 Value'

#Land Parcel 2 Vacant Land Price
if Parcel_Suburb_2 == BANTRY_BAY:
    Parcel_Land_2 = BANTRY_BAY_Land
    Parcel_WO_Conc_Sale_2 = BANTRY_BAY_WO_Conc_Sale
    Parcel_W_Conc_Sale_2 = BANTRY_BAY_W_Conc_Sale
    Parcel_Muni_2 = BANTRY_BAY_Muni
    Parcel_Rent_WO_Conc_Res_2 = BANTRY_BAY_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_2 = BANTRY_BAY_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_2 = BANTRY_BAY_Rent_Low_Res
    Parcel_Rent_Med_Res_2 = BANTRY_BAY_Rent_Med_Res
    Parcel_Rent_Office_2 = BANTRY_BAY_Rent_Office
    Parcel_Rent_Retail_2 = BANTRY_BAY_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_2 = BANTRY_BAY_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_2 = BANTRY_BAY_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_2 = BANTRY_BAY_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_2 = BANTRY_BAY_Sale_Parking_W_Conc
    Suburb_Name_2 = "BANTRY_BAY"
elif Parcel_Suburb_2 == BROOKLYN:
    Parcel_Land_2 = BROOKLYN_Land
    Parcel_WO_Conc_Sale_2 = BROOKLYN_WO_Conc_Sale
    Parcel_W_Conc_Sale_2 = BROOKLYN_W_Conc_Sale
    Parcel_Muni_2 = BROOKLYN_Muni
    Parcel_Rent_WO_Conc_Res_2 = BROOKLYN_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_2 = BROOKLYN_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_2 = BROOKLYN_Rent_Low_Res
    Parcel_Rent_Med_Res_2 = BROOKLYN_Rent_Med_Res
    Parcel_Rent_Office_2 = BROOKLYN_Rent_Office
    Parcel_Rent_Retail_2 = BROOKLYN_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_2 = BROOKLYN_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_2 = BROOKLYN_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_2 = BROOKLYN_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_2 = BROOKLYN_Sale_Parking_W_Conc
    Suburb_Name_2 = "BROOKLYN"
elif Parcel_Suburb_2 == CAPE_TOWN_CITY_CENTRE:
    Parcel_Land_2 = CAPE_TOWN_CITY_CENTRE_Land
    Parcel_WO_Conc_Sale_2 = CAPE_TOWN_CITY_CENTRE_WO_Conc_Sale
    Parcel_W_Conc_Sale_2 = CAPE_TOWN_CITY_CENTRE_W_Conc_Sale
    Parcel_Muni_2 = CAPE_TOWN_CITY_CENTRE_Muni
    Parcel_Rent_WO_Conc_Res_2 = CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_2 = CAPE_TOWN_CITY_CENTRE_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_2 = CAPE_TOWN_CITY_CENTRE_Rent_Low_Res
    Parcel_Rent_Med_Res_2 = CAPE_TOWN_CITY_CENTRE_Rent_Med_Res
    Parcel_Rent_Office_2 = CAPE_TOWN_CITY_CENTRE_Rent_Office
    Parcel_Rent_Retail_2 = CAPE_TOWN_CITY_CENTRE_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_2 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_2 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_2 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_2 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_W_Conc
    Suburb_Name_2 = "CAPE_TOWN_CITY_CENTRE"
elif Parcel_Suburb_2 == FORESHORE:
    Parcel_Land_2 = FORESHORE_Land
    Parcel_WO_Conc_Sale_2 = FORESHORE_WO_Conc_Sale
    Parcel_W_Conc_Sale_2 = FORESHORE_W_Conc_Sale

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Parcel_Muni_2 = FORESHORE_Muni
Parcel_Rent_WO_Conc_Res_2 = FORESHORE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = FORESHORE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = FORESHORE_Rent_Low_Res
Parcel_Rent_Med_Res_2 = FORESHORE_Rent_Med_Res
Parcel_Rent_Office_2 = FORESHORE_Rent_Office
Parcel_Rent_Retail_2 = FORESHORE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = FORESHORE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = FORESHORE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = FORESHORE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = FORESHORE_Sale_Parking_W_Conc
Suburb_Name_2 = "FORESHORE"
elif Parcel_Suburb_2 == FRESNAYE:
Parcel_Land_2 = FRESNAYE_Land
Parcel_WO_Conc_Sale_2 = FRESNAYE_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = FRESNAYE_W_Conc_Sale
Parcel_Muni_2 = FRESNAYE_Muni
Parcel_Rent_WO_Conc_Res_2 = FRESNAYE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = FRESNAYE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = FRESNAYE_Rent_Low_Res
Parcel_Rent_Med_Res_2 = FRESNAYE_Rent_Med_Res
Parcel_Rent_Office_2 = FRESNAYE_Rent_Office
Parcel_Rent_Retail_2 = FRESNAYE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = FRESNAYE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = FRESNAYE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = FRESNAYE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = FRESNAYE_Sale_Parking_W_Conc
Suburb_Name_2 = "FRESNAYE"
elif Parcel_Suburb_2 == GARDENS:
Parcel_Land_2 = GARDENS_Land
Parcel_WO_Conc_Sale_2 = GARDENS_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = GARDENS_W_Conc_Sale
Parcel_Muni_2 = GARDENS_Muni
Parcel_Rent_WO_Conc_Res_2 = GARDENS_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = GARDENS_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = GARDENS_Rent_Low_Res
Parcel_Rent_Med_Res_2 = GARDENS_Rent_Med_Res
Parcel_Rent_Office_2 = GARDENS_Rent_Office
Parcel_Rent_Retail_2 = GARDENS_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = GARDENS_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = GARDENS_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = GARDENS_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = GARDENS_Sale_Parking_W_Conc
Suburb_Name_2 = "GARDENS"
elif Parcel_Suburb_2 == GREEN_POINT:
Parcel_Land_2 = GREEN_POINT_Land
Parcel_WO_Conc_Sale_2 = GREEN_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = GREEN_POINT_W_Conc_Sale
Parcel_Muni_2 = GREEN_POINT_Muni
Parcel_Rent_WO_Conc_Res_2 = GREEN_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = GREEN_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = GREEN_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_2 = GREEN_POINT_Rent_Med_Res
Parcel_Rent_Office_2 = GREEN_POINT_Rent_Office
Parcel_Rent_Retail_2 = GREEN_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = GREEN_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = GREEN_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = GREEN_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = GREEN_POINT_Sale_Parking_W_Conc
Suburb_Name_2 = "GREEN_POINT"
elif Parcel_Suburb_2 == MAITLAND:
Parcel_Land_2 = MAITLAND_Land
Parcel_WO_Conc_Sale_2 = MAITLAND_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = MAITLAND_W_Conc_Sale
Parcel_Muni_2 = MAITLAND_Muni
Parcel_Rent_WO_Conc_Res_2 = MAITLAND_Rent_WO_Conc_Res

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Parcel_Rent_W_Conc_Res_2 = MAITLAND_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = MAITLAND_Rent_Low_Res
Parcel_Rent_Med_Res_2 = MAITLAND_Rent_Med_Res
Parcel_Rent_Office_2 = MAITLAND_Rent_Office
Parcel_Rent_Retail_2 = MAITLAND_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = MAITLAND_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = MAITLAND_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = MAITLAND_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = MAITLAND_Sale_Parking_W_Conc
Suburb_Name_2 = "MAITLAND"
elif Parcel_Suburb_2 == MAITLAND_GARDEN_VILLAGE:
Parcel_Land_2 = MAITLAND_GARDEN_VILLAGE_Land
Parcel_WO_Conc_Sale_2 = MAITLAND_GARDEN_VILLAGE_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = MAITLAND_GARDEN_VILLAGE_W_Conc_Sale
Parcel_Muni_2 = MAITLAND_GARDEN_VILLAGE_Muni
Parcel_Rent_WO_Conc_Res_2 = MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = MAITLAND_GARDEN_VILLAGE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = MAITLAND_GARDEN_VILLAGE_Rent_Low_Res
Parcel_Rent_Med_Res_2 = MAITLAND_GARDEN_VILLAGE_Rent_Med_Res
Parcel_Rent_Office_2 = MAITLAND_GARDEN_VILLAGE_Rent_Office
Parcel_Rent_Retail_2 = MAITLAND_GARDEN_VILLAGE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_W_Conc
Suburb_Name_2 = "MAITLAND_GARDEN_VILLAGE"
elif Parcel_Suburb_2 == MOUILLE_POINT:
Parcel_Land_2 = MOUILLE_POINT_Land
Parcel_WO_Conc_Sale_2 = MOUILLE_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = MOUILLE_POINT_W_Conc_Sale
Parcel_Muni_2 = MOUILLE_POINT_Muni
Parcel_Rent_WO_Conc_Res_2 = MOUILLE_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = MOUILLE_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = MOUILLE_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_2 = MOUILLE_POINT_Rent_Med_Res
Parcel_Rent_Office_2 = MOUILLE_POINT_Rent_Office
Parcel_Rent_Retail_2 = MOUILLE_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = MOUILLE_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = MOUILLE_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = MOUILLE_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = MOUILLE_POINT_Sale_Parking_W_Conc
Suburb_Name_2 = "MOUILLE_POINT"
elif Parcel_Suburb_2 == MOWBRAY:
Parcel_Land_2 = MOWBRAY_Land
Parcel_WO_Conc_Sale_2 = MOWBRAY_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = MOWBRAY_W_Conc_Sale
Parcel_Muni_2 = MOWBRAY_Muni
Parcel_Rent_WO_Conc_Res_2 = MOWBRAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = MOWBRAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = MOWBRAY_Rent_Low_Res
Parcel_Rent_Med_Res_2 = MOWBRAY_Rent_Med_Res
Parcel_Rent_Office_2 = MOWBRAY_Rent_Office
Parcel_Rent_Retail_2 = MOWBRAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = MOWBRAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = MOWBRAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = MOWBRAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = MOWBRAY_Sale_Parking_W_Conc
Suburb_Name_2 = "MOWBRAY"
elif Parcel_Suburb_2 == OBSERVATORY:
Parcel_Land_2 = OBSERVATORY_Land
Parcel_WO_Conc_Sale_2 = OBSERVATORY_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = OBSERVATORY_W_Conc_Sale
Parcel_Muni_2 = OBSERVATORY_Muni
Parcel_Rent_WO_Conc_Res_2 = OBSERVATORY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = OBSERVATORY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = OBSERVATORY_Rent_Low_Res

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Parcel_Rent_Med_Res_2 = OBSERVATORY_Rent_Med_Res
Parcel_Rent_Office_2 = OBSERVATORY_Rent_Office
Parcel_Rent_Retail_2 = OBSERVATORY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = OBSERVATORY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = OBSERVATORY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = OBSERVATORY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = OBSERVATORY_Sale_Parking_W_Conc
Suburb_Name_2 = "OBSERVATORY"
elif Parcel_Suburb_2 == ORANJEZICHT:
Parcel_Land_2 = ORANJEZICHT_Land
Parcel_WO_Conc_Sale_2 = ORANJEZICHT_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = ORANJEZICHT_W_Conc_Sale
Parcel_Muni_2 = ORANJEZICHT_Muni
Parcel_Rent_WO_Conc_Res_2 = ORANJEZICHT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = ORANJEZICHT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = ORANJEZICHT_Rent_Low_Res
Parcel_Rent_Med_Res_2 = ORANJEZICHT_Rent_Med_Res
Parcel_Rent_Office_2 = ORANJEZICHT_Rent_Office
Parcel_Rent_Retail_2 = ORANJEZICHT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = ORANJEZICHT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = ORANJEZICHT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = ORANJEZICHT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = ORANJEZICHT_Sale_Parking_W_Conc
Suburb_Name_2 = "ORANJEZICHT"
elif Parcel_Suburb_2 == PAARDEN_EILAND:
Parcel_Land_2 = PAARDEN_EILAND_Land
Parcel_WO_Conc_Sale_2 = PAARDEN_EILAND_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = PAARDEN_EILAND_W_Conc_Sale
Parcel_Muni_2 = PAARDEN_EILAND_Muni
Parcel_Rent_WO_Conc_Res_2 = PAARDEN_EILAND_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = PAARDEN_EILAND_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = PAARDEN_EILAND_Rent_Low_Res
Parcel_Rent_Med_Res_2 = PAARDEN_EILAND_Rent_Med_Res
Parcel_Rent_Office_2 = PAARDEN_EILAND_Rent_Office
Parcel_Rent_Retail_2 = PAARDEN_EILAND_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = PAARDEN_EILAND_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = PAARDEN_EILAND_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = PAARDEN_EILAND_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = PAARDEN_EILAND_Sale_Parking_W_Conc
Suburb_Name_2 = "PAARDEN_EILAND"
elif Parcel_Suburb_2 == RONDEBOSCH:
Parcel_Land_2 = RONDEBOSCH_Land
Parcel_WO_Conc_Sale_2 = RONDEBOSCH_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = RONDEBOSCH_W_Conc_Sale
Parcel_Muni_2 = RONDEBOSCH_Muni
Parcel_Rent_WO_Conc_Res_2 = RONDEBOSCH_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = RONDEBOSCH_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = RONDEBOSCH_Rent_Low_Res
Parcel_Rent_Med_Res_2 = RONDEBOSCH_Rent_Med_Res
Parcel_Rent_Office_2 = RONDEBOSCH_Rent_Office
Parcel_Rent_Retail_2 = RONDEBOSCH_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = RONDEBOSCH_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = RONDEBOSCH_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = RONDEBOSCH_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = RONDEBOSCH_Sale_Parking_W_Conc
Suburb_Name_2 = "RONDEBOSCH"
elif Parcel_Suburb_2 == ROSEBANK:
Parcel_Land_2 = ROSEBANK_Land
Parcel_WO_Conc_Sale_2 = ROSEBANK_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = ROSEBANK_W_Conc_Sale
Parcel_Muni_2 = ROSEBANK_Muni
Parcel_Rent_WO_Conc_Res_2 = ROSEBANK_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = ROSEBANK_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = ROSEBANK_Rent_Low_Res
Parcel_Rent_Med_Res_2 = ROSEBANK_Rent_Med_Res
Parcel_Rent_Office_2 = ROSEBANK_Rent_Office

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Parcel_Rent_Retail_2 = ROSEBANK_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = ROSEBANK_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = ROSEBANK_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = ROSEBANK_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = ROSEBANK_Sale_Parking_W_Conc
Suburb_Name_2 = "ROSEBANK"
elif Parcel_Suburb_2 == SALT_RIVER:
Parcel_Land_2 = SALT_RIVER_Land
Parcel_WO_Conc_Sale_2 = SALT_RIVER_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = SALT_RIVER_W_Conc_Sale
Parcel_Muni_2 = SALT_RIVER_Muni
Parcel_Rent_WO_Conc_Res_2 = SALT_RIVER_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = SALT_RIVER_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = SALT_RIVER_Rent_Low_Res
Parcel_Rent_Med_Res_2 = SALT_RIVER_Rent_Med_Res
Parcel_Rent_Office_2 = SALT_RIVER_Rent_Office
Parcel_Rent_Retail_2 = SALT_RIVER_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = SALT_RIVER_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = SALT_RIVER_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = SALT_RIVER_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = SALT_RIVER_Sale_Parking_W_Conc
Suburb_Name_2 = "SALT_RIVER"
elif Parcel_Suburb_2 == SCHOTSCHEKLOOF:
Parcel_Land_2 = SCHOTSCHEKLOOF_Land
Parcel_WO_Conc_Sale_2 = SCHOTSCHEKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = SCHOTSCHEKLOOF_W_Conc_Sale
Parcel_Muni_2 = SCHOTSCHEKLOOF_Muni
Parcel_Rent_WO_Conc_Res_2 = SCHOTSCHEKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = SCHOTSCHEKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = SCHOTSCHEKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_2 = SCHOTSCHEKLOOF_Rent_Med_Res
Parcel_Rent_Office_2 = SCHOTSCHEKLOOF_Rent_Office
Parcel_Rent_Retail_2 = SCHOTSCHEKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = SCHOTSCHEKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = SCHOTSCHEKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = SCHOTSCHEKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = SCHOTSCHEKLOOF_Sale_Parking_W_Conc
Suburb_Name_2 = "SCHOTSCHEKLOOF"
elif Parcel_Suburb_2 == SEA_POINT:
Parcel_Land_2 = SEA_POINT_Land
Parcel_WO_Conc_Sale_2 = SEA_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = SEA_POINT_W_Conc_Sale
Parcel_Muni_2 = SEA_POINT_Muni
Parcel_Rent_WO_Conc_Res_2 = SEA_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = SEA_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = SEA_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_2 = SEA_POINT_Rent_Med_Res
Parcel_Rent_Office_2 = SEA_POINT_Rent_Office
Parcel_Rent_Retail_2 = SEA_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = SEA_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_2 = SEA_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = SEA_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = SEA_POINT_Sale_Parking_W_Conc
Suburb_Name_2 = "SEA_POINT"
elif Parcel_Suburb_2 == TAMBOERSKLOOF:
Parcel_Land_2 = TAMBOERSKLOOF_Land
Parcel_WO_Conc_Sale_2 = TAMBOERSKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_2 = TAMBOERSKLOOF_W_Conc_Sale
Parcel_Muni_2 = TAMBOERSKLOOF_Muni
Parcel_Rent_WO_Conc_Res_2 = TAMBOERSKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_2 = TAMBOERSKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_2 = TAMBOERSKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_2 = TAMBOERSKLOOF_Rent_Med_Res
Parcel_Rent_Office_2 = TAMBOERSKLOOF_Rent_Office
Parcel_Rent_Retail_2 = TAMBOERSKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_2 = TAMBOERSKLOOF_Rent_Parking_WO_Conc

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Parcel_Rent_Parking_W_Conc_2 = TAMBOERSKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_2 = TAMBOERSKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_2 = TAMBOERSKLOOF_Sale_Parking_W_Conc
Suburb_Name_2 = "TAMBOERSKLOOF"
elif Parcel_Suburb_2 == THREE_ANCHOR_BAY:
    Parcel_Land_2 = THREE_ANCHOR_BAY_Land
    Parcel_WO_Conc_Sale_2 = THREE_ANCHOR_BAY_WO_Conc_Sale
    Parcel_W_Conc_Sale_2 = THREE_ANCHOR_BAY_W_Conc_Sale
    Parcel_Muni_2 = THREE_ANCHOR_BAY_Muni
    Parcel_Rent_WO_Conc_Res_2 = THREE_ANCHOR_BAY_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_2 = THREE_ANCHOR_BAY_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_2 = THREE_ANCHOR_BAY_Rent_Low_Res
    Parcel_Rent_Med_Res_2 = THREE_ANCHOR_BAY_Rent_Med_Res
    Parcel_Rent_Office_2 = THREE_ANCHOR_BAY_Rent_Office
    Parcel_Rent_Retail_2 = THREE_ANCHOR_BAY_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_2 = THREE_ANCHOR_BAY_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_2 = THREE_ANCHOR_BAY_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_2 = THREE_ANCHOR_BAY_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_2 = THREE_ANCHOR_BAY_Sale_Parking_W_Conc
    Suburb_Name_2 = "THREE_ANCHOR_BAY"
elif Parcel_Suburb_2 == VREDEHOEK:
    Parcel_Land_2 = VREDEHOEK_Land
    Parcel_WO_Conc_Sale_2 = VREDEHOEK_WO_Conc_Sale
    Parcel_W_Conc_Sale_2 = VREDEHOEK_W_Conc_Sale
    Parcel_Muni_2 = VREDEHOEK_Muni
    Parcel_Rent_WO_Conc_Res_2 = VREDEHOEK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_2 = VREDEHOEK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_2 = VREDEHOEK_Rent_Low_Res
    Parcel_Rent_Med_Res_2 = VREDEHOEK_Rent_Med_Res
    Parcel_Rent_Office_2 = VREDEHOEK_Rent_Office
    Parcel_Rent_Retail_2 = VREDEHOEK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_2 = VREDEHOEK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_2 = VREDEHOEK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_2 = VREDEHOEK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_2 = VREDEHOEK_Sale_Parking_W_Conc
    Suburb_Name_3 = "VREDEHOEK"
elif Parcel_Suburb_2 == WOODSTOCK:
    Parcel_Land_2 = WOODSTOCK_Land
    Parcel_WO_Conc_Sale_2 = WOODSTOCK_WO_Conc_Sale
    Parcel_W_Conc_Sale_2 = WOODSTOCK_W_Conc_Sale
    Parcel_Muni_2 = WOODSTOCK_Muni
    Parcel_Rent_WO_Conc_Res_2 = WOODSTOCK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_2 = WOODSTOCK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_2 = WOODSTOCK_Rent_Low_Res
    Parcel_Rent_Med_Res_2 = WOODSTOCK_Rent_Med_Res
    Parcel_Rent_Office_2 = WOODSTOCK_Rent_Office
    Parcel_Rent_Retail_2 = WOODSTOCK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_2 = WOODSTOCK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_2 = WOODSTOCK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_2 = WOODSTOCK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_2 = WOODSTOCK_Sale_Parking_W_Conc
    Suburb_Name_2 = "WOODSTOCK"
elif Parcel_Suburb_2 == ZONNEBLOEM:
    Parcel_Land_2 = ZONNEBLOEM_Land
    Parcel_WO_Conc_Sale_2 = ZONNEBLOEM_WO_Conc_Sale
    Parcel_W_Conc_Sale_2 = ZONNEBLOEM_W_Conc_Sale
    Parcel_Muni_2 = ZONNEBLOEM_Muni
    Parcel_Rent_WO_Conc_Res_2 = ZONNEBLOEM_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_2 = ZONNEBLOEM_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_2 = ZONNEBLOEM_Rent_Low_Res
    Parcel_Rent_Med_Res_2 = ZONNEBLOEM_Rent_Med_Res
    Parcel_Rent_Office_2 = ZONNEBLOEM_Rent_Office
    Parcel_Rent_Retail_2 = ZONNEBLOEM_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_2 = ZONNEBLOEM_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_2 = ZONNEBLOEM_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_2 = ZONNEBLOEM_Sale_Parking_WO_Conc

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Parcel_Sale_Parking_W_Conc_2 = ZONNEBLOEM_Sale_Parking_W_Conc
Suburb_Name_2 = "ZONNEBLOEM"
else:
    print 'Error Land Parcel 2 Value'

#Land Parcel 3 Vacant Land Price
if Parcel_Suburb_3 == BANTRY_BAY:
    Parcel_Land_3 = BANTRY_BAY_Land
    Parcel_WO_Conc_Sale_3 = BANTRY_BAY_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = BANTRY_BAY_W_Conc_Sale
    Parcel_Muni_3 = BANTRY_BAY_Muni
    Parcel_Rent_WO_Conc_Res_3 = BANTRY_BAY_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = BANTRY_BAY_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = BANTRY_BAY_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = BANTRY_BAY_Rent_Med_Res
    Parcel_Rent_Office_3 = BANTRY_BAY_Rent_Office
    Parcel_Rent_Retail_3 = BANTRY_BAY_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = BANTRY_BAY_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = BANTRY_BAY_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = BANTRY_BAY_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = BANTRY_BAY_Sale_Parking_W_Conc
    Suburb_Name_3 = "BANTRY_BAY"
elif Parcel_Suburb_3 == BROOKLYN:
    Parcel_Land_3 = BROOKLYN_Land
    Parcel_WO_Conc_Sale_3 = BROOKLYN_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = BROOKLYN_W_Conc_Sale
    Parcel_Muni_3 = BROOKLYN_Muni
    Parcel_Rent_WO_Conc_Res_3 = BROOKLYN_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = BROOKLYN_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = BROOKLYN_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = BROOKLYN_Rent_Med_Res
    Parcel_Rent_Office_3 = BROOKLYN_Rent_Office
    Parcel_Rent_Retail_3 = BROOKLYN_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = BROOKLYN_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = BROOKLYN_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = BROOKLYN_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = BROOKLYN_Sale_Parking_W_Conc
    Suburb_Name_3 = "BROOKLYN"
elif Parcel_Suburb_3 == CAPE_TOWN_CITY_CENTRE:
    Parcel_Land_3 = CAPE_TOWN_CITY_CENTRE_Land
    Parcel_WO_Conc_Sale_3 = CAPE_TOWN_CITY_CENTRE_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = CAPE_TOWN_CITY_CENTRE_W_Conc_Sale
    Parcel_Muni_3 = CAPE_TOWN_CITY_CENTRE_Muni
    Parcel_Rent_WO_Conc_Res_3 = CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = CAPE_TOWN_CITY_CENTRE_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = CAPE_TOWN_CITY_CENTRE_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = CAPE_TOWN_CITY_CENTRE_Rent_Med_Res
    Parcel_Rent_Office_3 = CAPE_TOWN_CITY_CENTRE_Rent_Office
    Parcel_Rent_Retail_3 = CAPE_TOWN_CITY_CENTRE_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_W_Conc
    Suburb_Name_3 = "CAPE_TOWN_CITY_CENTRE"
elif Parcel_Suburb_3 == FORESHORE:
    Parcel_Land_3 = FORESHORE_Land
    Parcel_WO_Conc_Sale_3 = FORESHORE_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = FORESHORE_W_Conc_Sale
    Parcel_Muni_3 = FORESHORE_Muni
    Parcel_Rent_WO_Conc_Res_3 = FORESHORE_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = FORESHORE_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = FORESHORE_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = FORESHORE_Rent_Med_Res
    Parcel_Rent_Office_3 = FORESHORE_Rent_Office
    Parcel_Rent_Retail_3 = FORESHORE_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = FORESHORE_Rent_Parking_WO_Conc

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Parcel_Rent_Parking_W_Conc_3 = FORESHORE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = FORESHORE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = FORESHORE_Sale_Parking_W_Conc
Suburb_Name_3 = "FORESHORE"
elif Parcel_Suburb_3 == FRESNAYE:
    Parcel_Land_3 = FRESNAYE_Land
    Parcel_WO_Conc_Sale_3 = FRESNAYE_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = FRESNAYE_W_Conc_Sale
    Parcel_Muni_3 = FRESNAYE_Muni
    Parcel_Rent_WO_Conc_Res_3 = FRESNAYE_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = FRESNAYE_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = FRESNAYE_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = FRESNAYE_Rent_Med_Res
    Parcel_Rent_Office_3 = FRESNAYE_Rent_Office
    Parcel_Rent_Retail_3 = FRESNAYE_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = FRESNAYE_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = FRESNAYE_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = FRESNAYE_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = FRESNAYE_Sale_Parking_W_Conc
    Suburb_Name_3 = "FRESNAYE"
elif Parcel_Suburb_3 == GARDENS:
    Parcel_Land_3 = GARDENS_Land
    Parcel_WO_Conc_Sale_3 = GARDENS_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = GARDENS_W_Conc_Sale
    Parcel_Muni_3 = GARDENS_Muni
    Parcel_Rent_WO_Conc_Res_3 = GARDENS_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = GARDENS_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = GARDENS_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = GARDENS_Rent_Med_Res
    Parcel_Rent_Office_3 = GARDENS_Rent_Office
    Parcel_Rent_Retail_3 = GARDENS_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = GARDENS_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = GARDENS_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = GARDENS_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = GARDENS_Sale_Parking_W_Conc
    Suburb_Name_3 = "GARDENS"
elif Parcel_Suburb_3 == GREEN_POINT:
    Parcel_Land_3 = GREEN_POINT_Land
    Parcel_WO_Conc_Sale_3 = GREEN_POINT_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = GREEN_POINT_W_Conc_Sale
    Parcel_Muni_3 = GREEN_POINT_Muni
    Parcel_Rent_WO_Conc_Res_3 = GREEN_POINT_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = GREEN_POINT_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = GREEN_POINT_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = GREEN_POINT_Rent_Med_Res
    Parcel_Rent_Office_3 = GREEN_POINT_Rent_Office
    Parcel_Rent_Retail_3 = GREEN_POINT_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = GREEN_POINT_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = GREEN_POINT_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = GREEN_POINT_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = GREEN_POINT_Sale_Parking_W_Conc
    Suburb_Name_3 = "GREEN_POINT"
elif Parcel_Suburb_3 == MAITLAND:
    Parcel_Land_3 = MAITLAND_Land
    Parcel_WO_Conc_Sale_3 = MAITLAND_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = MAITLAND_W_Conc_Sale
    Parcel_Muni_3 = MAITLAND_Muni
    Parcel_Rent_WO_Conc_Res_3 = MAITLAND_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = MAITLAND_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = MAITLAND_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = MAITLAND_Rent_Med_Res
    Parcel_Rent_Office_3 = MAITLAND_Rent_Office
    Parcel_Rent_Retail_3 = MAITLAND_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = MAITLAND_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = MAITLAND_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = MAITLAND_Sale_Parking_WO_Conc

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Parcel_Sale_Parking_W_Conc_3 = MAITLAND_Sale_Parking_W_Conc
Suburb_Name_3 = "MAITLAND"
elif Parcel_Suburb_3 == MAITLAND_GARDEN_VILLAGE:
Parcel_Land_3 = MAITLAND_GARDEN_VILLAGE_Land
Parcel_WO_Conc_Sale_3 = MAITLAND_GARDEN_VILLAGE_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = MAITLAND_GARDEN_VILLAGE_W_Conc_Sale
Parcel_Muni_3 = MAITLAND_GARDEN_VILLAGE_Muni
Parcel_Rent_WO_Conc_Res_3 = MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = MAITLAND_GARDEN_VILLAGE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = MAITLAND_GARDEN_VILLAGE_Rent_Low_Res
Parcel_Rent_Med_Res_3 = MAITLAND_GARDEN_VILLAGE_Rent_Med_Res
Parcel_Rent_Office_3 = MAITLAND_GARDEN_VILLAGE_Rent_Office
Parcel_Rent_Retail_3 = MAITLAND_GARDEN_VILLAGE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_W_Conc
Suburb_Name_3 = "MAITLAND_GARDEN_VILLAGE"
elif Parcel_Suburb_3 == MOUILLE_POINT:
Parcel_Land_3 = MOUILLE_POINT_Land
Parcel_WO_Conc_Sale_3 = MOUILLE_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = MOUILLE_POINT_W_Conc_Sale
Parcel_Muni_3 = MOUILLE_POINT_Muni
Parcel_Rent_WO_Conc_Res_3 = MOUILLE_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = MOUILLE_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = MOUILLE_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_3 = MOUILLE_POINT_Rent_Med_Res
Parcel_Rent_Office_3 = MOUILLE_POINT_Rent_Office
Parcel_Rent_Retail_3 = MOUILLE_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = MOUILLE_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = MOUILLE_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = MOUILLE_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = MOUILLE_POINT_Sale_Parking_W_Conc
Suburb_Name_3 = "MOUILLE_POINT"
elif Parcel_Suburb_3 == MOWBRAY:
Parcel_Land_3 = MOWBRAY_Land
Parcel_WO_Conc_Sale_3 = MOWBRAY_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = MOWBRAY_W_Conc_Sale
Parcel_Muni_3 = MOWBRAY_Muni
Parcel_Rent_WO_Conc_Res_3 = MOWBRAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = MOWBRAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = MOWBRAY_Rent_Low_Res
Parcel_Rent_Med_Res_3 = MOWBRAY_Rent_Med_Res
Parcel_Rent_Office_3 = MOWBRAY_Rent_Office
Parcel_Rent_Retail_3 = MOWBRAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = MOWBRAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = MOWBRAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = MOWBRAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = MOWBRAY_Sale_Parking_W_Conc
Suburb_Name_3 = "MOWBRAY"
elif Parcel_Suburb_3 == OBSERVATORY:
Parcel_Land_3 = OBSERVATORY_Land
Parcel_WO_Conc_Sale_3 = OBSERVATORY_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = OBSERVATORY_W_Conc_Sale
Parcel_Muni_3 = OBSERVATORY_Muni
Parcel_Rent_WO_Conc_Res_3 = OBSERVATORY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = OBSERVATORY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = OBSERVATORY_Rent_Low_Res
Parcel_Rent_Med_Res_3 = OBSERVATORY_Rent_Med_Res
Parcel_Rent_Office_3 = OBSERVATORY_Rent_Office
Parcel_Rent_Retail_3 = OBSERVATORY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = OBSERVATORY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = OBSERVATORY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = OBSERVATORY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = OBSERVATORY_Sale_Parking_W_Conc
Suburb_Name_3 = "OBSERVATORY"

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elif Parcel_Suburb_3 == ORANJEZICHT:
    Parcel_Land_3 = ORANJEZICHT_Land
    Parcel_WO_Conc_Sale_3 = ORANJEZICHT_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = ORANJEZICHT_W_Conc_Sale
    Parcel_Muni_3 = ORANJEZICHT_Muni
    Parcel_Rent_WO_Conc_Res_3 = ORANJEZICHT_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = ORANJEZICHT_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = ORANJEZICHT_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = ORANJEZICHT_Rent_Med_Res
    Parcel_Rent_Office_3 = ORANJEZICHT_Rent_Office
    Parcel_Rent_Retail_3 = ORANJEZICHT_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = ORANJEZICHT_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = ORANJEZICHT_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = ORANJEZICHT_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = ORANJEZICHT_Sale_Parking_W_Conc
    Suburb_Name_3 = "ORANJEZICHT"
elif Parcel_Suburb_3 == PAARDEN_EILAND:
    Parcel_Land_3 = PAARDEN_EILAND_Land
    Parcel_WO_Conc_Sale_3 = PAARDEN_EILAND_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = PAARDEN_EILAND_W_Conc_Sale
    Parcel_Muni_3 = PAARDEN_EILAND_Muni
    Parcel_Rent_WO_Conc_Res_3 = PAARDEN_EILAND_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = PAARDEN_EILAND_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = PAARDEN_EILAND_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = PAARDEN_EILAND_Rent_Med_Res
    Parcel_Rent_Office_3 = PAARDEN_EILAND_Rent_Office
    Parcel_Rent_Retail_3 = PAARDEN_EILAND_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = PAARDEN_EILAND_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = PAARDEN_EILAND_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = PAARDEN_EILAND_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = PAARDEN_EILAND_Sale_Parking_W_Conc
    Suburb_Name_3 = "PAARDEN_EILAND"
elif Parcel_Suburb_3 == RONDEBOSCH:
    Parcel_Land_3 = RONDEBOSCH_Land
    Parcel_WO_Conc_Sale_3 = RONDEBOSCH_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = RONDEBOSCH_W_Conc_Sale
    Parcel_Muni_3 = RONDEBOSCH_Muni
    Parcel_Rent_WO_Conc_Res_3 = RONDEBOSCH_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = RONDEBOSCH_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = RONDEBOSCH_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = RONDEBOSCH_Rent_Med_Res
    Parcel_Rent_Office_3 = RONDEBOSCH_Rent_Office
    Parcel_Rent_Retail_3 = RONDEBOSCH_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = RONDEBOSCH_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = RONDEBOSCH_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = RONDEBOSCH_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = RONDEBOSCH_Sale_Parking_W_Conc
    Suburb_Name_3 = "RONDEBOSCH"
elif Parcel_Suburb_3 == ROSEBANK:
    Parcel_Land_3 = ROSEBANK_Land
    Parcel_WO_Conc_Sale_3 = ROSEBANK_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = ROSEBANK_W_Conc_Sale
    Parcel_Muni_3 = ROSEBANK_Muni
    Parcel_Rent_WO_Conc_Res_3 = ROSEBANK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = ROSEBANK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = ROSEBANK_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = ROSEBANK_Rent_Med_Res
    Parcel_Rent_Office_3 = ROSEBANK_Rent_Office
    Parcel_Rent_Retail_3 = ROSEBANK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = ROSEBANK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = ROSEBANK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = ROSEBANK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = ROSEBANK_Sale_Parking_W_Conc
    Suburb_Name_3 = "ROSEBANK"
elif Parcel_Suburb_3 == SALT_RIVER:
    Parcel_Land_3 = SALT_RIVER_Land

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Parcel_WO_Conc_Sale_3 = SALT_RIVER_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = SALT_RIVER_W_Conc_Sale
Parcel_Muni_3 = SALT_RIVER_Muni
Parcel_Rent_WO_Conc_Res_3 = SALT_RIVER_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = SALT_RIVER_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = SALT_RIVER_Rent_Low_Res
Parcel_Rent_Med_Res_3 = SALT_RIVER_Rent_Med_Res
Parcel_Rent_Office_3 = SALT_RIVER_Rent_Office
Parcel_Rent_Retail_3 = SALT_RIVER_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = SALT_RIVER_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = SALT_RIVER_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = SALT_RIVER_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = SALT_RIVER_Sale_Parking_W_Conc
Suburb_Name_3 = "SALT_RIVER"
elif Parcel_Suburb_3 == SCHOTSCHEKLOOF:
Parcel_Land_3 = SCHOTSCHEKLOOF_Land
Parcel_WO_Conc_Sale_3 = SCHOTSCHEKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = SCHOTSCHEKLOOF_W_Conc_Sale
Parcel_Muni_3 = SCHOTSCHEKLOOF_Muni
Parcel_Rent_WO_Conc_Res_3 = SCHOTSCHEKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = SCHOTSCHEKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = SCHOTSCHEKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_3 = SCHOTSCHEKLOOF_Rent_Med_Res
Parcel_Rent_Office_3 = SCHOTSCHEKLOOF_Rent_Office
Parcel_Rent_Retail_3 = SCHOTSCHEKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = SCHOTSCHEKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = SCHOTSCHEKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = SCHOTSCHEKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = SCHOTSCHEKLOOF_Sale_Parking_W_Conc
Suburb_Name_3 = "SCHOTSCHEKLOOF"
elif Parcel_Suburb_3 == SEA_POINT:
Parcel_Land_3 = SEA_POINT_Land
Parcel_WO_Conc_Sale_3 = SEA_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = SEA_POINT_W_Conc_Sale
Parcel_Muni_3 = SEA_POINT_Muni
Parcel_Rent_WO_Conc_Res_3 = SEA_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = SEA_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = SEA_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_3 = SEA_POINT_Rent_Med_Res
Parcel_Rent_Office_3 = SEA_POINT_Rent_Office
Parcel_Rent_Retail_3 = SEA_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = SEA_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = SEA_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = SEA_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = SEA_POINT_Sale_Parking_W_Conc
Suburb_Name_3 = "SEA_POINT"
elif Parcel_Suburb_3 == TAMBOERSKLOOF:
Parcel_Land_3 = TAMBOERSKLOOF_Land
Parcel_WO_Conc_Sale_3 = TAMBOERSKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = TAMBOERSKLOOF_W_Conc_Sale
Parcel_Muni_3 = TAMBOERSKLOOF_Muni
Parcel_Rent_WO_Conc_Res_3 = TAMBOERSKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = TAMBOERSKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = TAMBOERSKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_3 = TAMBOERSKLOOF_Rent_Med_Res
Parcel_Rent_Office_3 = TAMBOERSKLOOF_Rent_Office
Parcel_Rent_Retail_3 = TAMBOERSKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = TAMBOERSKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = TAMBOERSKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = TAMBOERSKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = TAMBOERSKLOOF_Sale_Parking_W_Conc
Suburb_Name_3 = "TAMBOERSKLOOF"
elif Parcel_Suburb_3 == THREE_ANCHOR_BAY:
Parcel_Land_3 = THREE_ANCHOR_BAY_Land
Parcel_WO_Conc_Sale_3 = THREE_ANCHOR_BAY_WO_Conc_Sale
Parcel_W_Conc_Sale_3 = THREE_ANCHOR_BAY_W_Conc_Sale

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Parcel_Muni_3 = THREE_ANCHOR_BAY_Muni
Parcel_Rent_WO_Conc_Res_3 = THREE_ANCHOR_BAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_3 = THREE_ANCHOR_BAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_3 = THREE_ANCHOR_BAY_Rent_Low_Res
Parcel_Rent_Med_Res_3 = THREE_ANCHOR_BAY_Rent_Med_Res
Parcel_Rent_Office_3 = THREE_ANCHOR_BAY_Rent_Office
Parcel_Rent_Retail_3 = THREE_ANCHOR_BAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_3 = THREE_ANCHOR_BAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_3 = THREE_ANCHOR_BAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_3 = THREE_ANCHOR_BAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_3 = THREE_ANCHOR_BAY_Sale_Parking_W_Conc
Suburb_Name_3 = "THREE_ANCHOR_BAY"
elif Parcel_Suburb_3 == VREDEHOEK:
    Parcel_Land_3 = VREDEHOEK_Land
    Parcel_WO_Conc_Sale_3 = VREDEHOEK_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = VREDEHOEK_W_Conc_Sale
    Parcel_Muni_3 = VREDEHOEK_Muni
    Parcel_Rent_WO_Conc_Res_3 = VREDEHOEK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = VREDEHOEK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = VREDEHOEK_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = VREDEHOEK_Rent_Med_Res
    Parcel_Rent_Office_3 = VREDEHOEK_Rent_Office
    Parcel_Rent_Retail_3 = VREDEHOEK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = VREDEHOEK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = VREDEHOEK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = VREDEHOEK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = VREDEHOEK_Sale_Parking_W_Conc
    Suburb_Name_3 = "VREDEHOEK"
elif Parcel_Suburb_3 == WOODSTOCK:
    Parcel_Land_3 = WOODSTOCK_Land
    Parcel_WO_Conc_Sale_3 = WOODSTOCK_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = WOODSTOCK_W_Conc_Sale
    Parcel_Muni_3 = WOODSTOCK_Muni
    Parcel_Rent_WO_Conc_Res_3 = WOODSTOCK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = WOODSTOCK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = WOODSTOCK_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = WOODSTOCK_Rent_Med_Res
    Parcel_Rent_Office_3 = WOODSTOCK_Rent_Office
    Parcel_Rent_Retail_3 = WOODSTOCK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = WOODSTOCK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = WOODSTOCK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = WOODSTOCK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = WOODSTOCK_Sale_Parking_W_Conc
    Suburb_Name_3 = "WOODSTOCK"
elif Parcel_Suburb_3 == ZONNEBLOEM:
    Parcel_Land_3 = ZONNEBLOEM_Land
    Parcel_WO_Conc_Sale_3 = ZONNEBLOEM_WO_Conc_Sale
    Parcel_W_Conc_Sale_3 = ZONNEBLOEM_W_Conc_Sale
    Parcel_Muni_3 = ZONNEBLOEM_Muni
    Parcel_Rent_WO_Conc_Res_3 = ZONNEBLOEM_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_3 = ZONNEBLOEM_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_3 = ZONNEBLOEM_Rent_Low_Res
    Parcel_Rent_Med_Res_3 = ZONNEBLOEM_Rent_Med_Res
    Parcel_Rent_Office_3 = ZONNEBLOEM_Rent_Office
    Parcel_Rent_Retail_3 = ZONNEBLOEM_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_3 = ZONNEBLOEM_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_3 = ZONNEBLOEM_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_3 = ZONNEBLOEM_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_3 = ZONNEBLOEM_Sale_Parking_W_Conc
    Suburb_Name_3 = "ZONNEBLOEM"
else:
    print 'Error Land Parcel 3 Value'

#Land Parcel 4 Vacant Land Price
if Parcel_Suburb_4 == BANTRY_BAY:
    Parcel_Land_4 = BANTRY_BAY_Land

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Parcel_WO_Conc_Sale_4 = BANTRY_BAY_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = BANTRY_BAY_W_Conc_Sale
Parcel_Muni_4 = BANTRY_BAY_Muni
Parcel_Rent_WO_Conc_Res_4 = BANTRY_BAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = BANTRY_BAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = BANTRY_BAY_Rent_Low_Res
Parcel_Rent_Med_Res_4 = BANTRY_BAY_Rent_Med_Res
Parcel_Rent_Office_4 = BANTRY_BAY_Rent_Office
Parcel_Rent_Retail_4 = BANTRY_BAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = BANTRY_BAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = BANTRY_BAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = BANTRY_BAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = BANTRY_BAY_Sale_Parking_W_Conc
Suburb_Name_4 = "BANTRY_BAY"
elif Parcel_Suburb_4 == BROOKLYN:
Parcel_Land_4 = BROOKLYN_Land
Parcel_WO_Conc_Sale_4 = BROOKLYN_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = BROOKLYN_W_Conc_Sale
Parcel_Muni_4 = BROOKLYN_Muni
Parcel_Rent_WO_Conc_Res_4 = BROOKLYN_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = BROOKLYN_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = BROOKLYN_Rent_Low_Res
Parcel_Rent_Med_Res_4 = BROOKLYN_Rent_Med_Res
Parcel_Rent_Office_4 = BROOKLYN_Rent_Office
Parcel_Rent_Retail_4 = BROOKLYN_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = BROOKLYN_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = BROOKLYN_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = BROOKLYN_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = BROOKLYN_Sale_Parking_W_Conc
Suburb_Name_4 = "BROOKLYN"
elif Parcel_Suburb_4 == CAPE_TOWN_CITY_CENTRE:
Parcel_Land_4 = CAPE_TOWN_CITY_CENTRE_Land
Parcel_WO_Conc_Sale_4 = CAPE_TOWN_CITY_CENTRE_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = CAPE_TOWN_CITY_CENTRE_W_Conc_Sale
Parcel_Muni_4 = CAPE_TOWN_CITY_CENTRE_Muni
Parcel_Rent_WO_Conc_Res_4 = CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = CAPE_TOWN_CITY_CENTRE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = CAPE_TOWN_CITY_CENTRE_Rent_Low_Res
Parcel_Rent_Med_Res_4 = CAPE_TOWN_CITY_CENTRE_Rent_Med_Res
Parcel_Rent_Office_4 = CAPE_TOWN_CITY_CENTRE_Rent_Office
Parcel_Rent_Retail_4 = CAPE_TOWN_CITY_CENTRE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_W_Conc
Suburb_Name_4 = "CAPE_TOWN_CITY_CENTRE"
elif Parcel_Suburb_4 == FORESHORE:
Parcel_Land_4 = FORESHORE_Land
Parcel_WO_Conc_Sale_4 = FORESHORE_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = FORESHORE_W_Conc_Sale
Parcel_Muni_4 = FORESHORE_Muni
Parcel_Rent_WO_Conc_Res_4 = FORESHORE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = FORESHORE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = FORESHORE_Rent_Low_Res
Parcel_Rent_Med_Res_4 = FORESHORE_Rent_Med_Res
Parcel_Rent_Office_4 = FORESHORE_Rent_Office
Parcel_Rent_Retail_4 = FORESHORE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = FORESHORE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = FORESHORE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = FORESHORE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = FORESHORE_Sale_Parking_W_Conc
Suburb_Name_4 = "FORESHORE"
elif Parcel_Suburb_4 == FRESNAYE:
Parcel_Land_4 = FRESNAYE_Land
Parcel_WO_Conc_Sale_4 = FRESNAYE_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = FRESNAYE_W_Conc_Sale

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Parcel_Muni_4 = FRESNAYE_Muni
Parcel_Rent_WO_Conc_Res_4 = FRESNAYE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = FRESNAYE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = FRESNAYE_Rent_Low_Res
Parcel_Rent_Med_Res_4 = FRESNAYE_Rent_Med_Res
Parcel_Rent_Office_4 = FRESNAYE_Rent_Office
Parcel_Rent_Retail_4 = FRESNAYE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = FRESNAYE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = FRESNAYE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = FRESNAYE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = FRESNAYE_Sale_Parking_W_Conc
Suburb_Name_4 = "FRESNAYE"
elif Parcel_Suburb_4 == GARDENS:
    Parcel_Land_4 = GARDENS_Land
    Parcel_WO_Conc_Sale_4 = GARDENS_WO_Conc_Sale
    Parcel_W_Conc_Sale_4 = GARDENS_W_Conc_Sale
    Parcel_Muni_4 = GARDENS_Muni
    Parcel_Rent_WO_Conc_Res_4 = GARDENS_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_4 = GARDENS_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_4 = GARDENS_Rent_Low_Res
    Parcel_Rent_Med_Res_4 = GARDENS_Rent_Med_Res
    Parcel_Rent_Office_4 = GARDENS_Rent_Office
    Parcel_Rent_Retail_4 = GARDENS_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_4 = GARDENS_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_4 = GARDENS_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_4 = GARDENS_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_4 = GARDENS_Sale_Parking_W_Conc
    Suburb_Name_4 = "GARDENS"
elif Parcel_Suburb_4 == GREEN_POINT:
    Parcel_Land_4 = GREEN_POINT_Land
    Parcel_WO_Conc_Sale_4 = GREEN_POINT_WO_Conc_Sale
    Parcel_W_Conc_Sale_4 = GREEN_POINT_W_Conc_Sale
    Parcel_Muni_4 = GREEN_POINT_Muni
    Parcel_Rent_WO_Conc_Res_4 = GREEN_POINT_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_4 = GREEN_POINT_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_4 = GREEN_POINT_Rent_Low_Res
    Parcel_Rent_Med_Res_4 = GREEN_POINT_Rent_Med_Res
    Parcel_Rent_Office_4 = GREEN_POINT_Rent_Office
    Parcel_Rent_Retail_4 = GREEN_POINT_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_4 = GREEN_POINT_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_4 = GREEN_POINT_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_4 = GREEN_POINT_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_4 = GREEN_POINT_Sale_Parking_W_Conc
    Suburb_Name_4 = "GREEN_POINT"
elif Parcel_Suburb_4 == MAITLAND:
    Parcel_Land_4 = MAITLAND_Land
    Parcel_WO_Conc_Sale_4 = MAITLAND_WO_Conc_Sale
    Parcel_W_Conc_Sale_4 = MAITLAND_W_Conc_Sale
    Parcel_Muni_4 = MAITLAND_Muni
    Parcel_Rent_WO_Conc_Res_4 = MAITLAND_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_4 = MAITLAND_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_4 = MAITLAND_Rent_Low_Res
    Parcel_Rent_Med_Res_4 = MAITLAND_Rent_Med_Res
    Parcel_Rent_Office_4 = MAITLAND_Rent_Office
    Parcel_Rent_Retail_4 = MAITLAND_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_4 = MAITLAND_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_4 = MAITLAND_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_4 = MAITLAND_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_4 = MAITLAND_Sale_Parking_W_Conc
    Suburb_Name_4 = "MAITLAND"
elif Parcel_Suburb_4 == MAITLAND_GARDEN_VILLAGE:
    Parcel_Land_4 = MAITLAND_GARDEN_VILLAGE_Land
    Parcel_WO_Conc_Sale_4 = MAITLAND_GARDEN_VILLAGE_WO_Conc_Sale
    Parcel_W_Conc_Sale_4 = MAITLAND_GARDEN_VILLAGE_W_Conc_Sale
    Parcel_Muni_4 = MAITLAND_GARDEN_VILLAGE_Muni
    Parcel_Rent_WO_Conc_Res_4 = MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res

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Parcel_Rent_W_Conc_Res_4 = MAITLAND_GARDEN_VILLAGE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = MAITLAND_GARDEN_VILLAGE_Rent_Low_Res
Parcel_Rent_Med_Res_4 = MAITLAND_GARDEN_VILLAGE_Rent_Med_Res
Parcel_Rent_Office_4 = MAITLAND_GARDEN_VILLAGE_Rent_Office
Parcel_Rent_Retail_4 = MAITLAND_GARDEN_VILLAGE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_W_Conc
Suburb_Name_4 = "MAITLAND_GARDEN_VILLAGE"
elif Parcel_Suburb_4 == MOUILLE_POINT:
Parcel_Land_4 = MOUILLE_POINT_Land
Parcel_WO_Conc_Sale_4 = MOUILLE_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = MOUILLE_POINT_W_Conc_Sale
Parcel_Muni_4 = MOUILLE_POINT_Muni
Parcel_Rent_WO_Conc_Res_4 = MOUILLE_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = MOUILLE_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = MOUILLE_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_4 = MOUILLE_POINT_Rent_Med_Res
Parcel_Rent_Office_4 = MOUILLE_POINT_Rent_Office
Parcel_Rent_Retail_4 = MOUILLE_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = MOUILLE_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = MOUILLE_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = MOUILLE_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = MOUILLE_POINT_Sale_Parking_W_Conc
Suburb_Name_4 = "MOUILLE_POINT"
elif Parcel_Suburb_4 == MOWBRAY:
Parcel_Land_4 = MOWBRAY_Land
Parcel_WO_Conc_Sale_4 = MOWBRAY_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = MOWBRAY_W_Conc_Sale
Parcel_Muni_4 = MOWBRAY_Muni
Parcel_Rent_WO_Conc_Res_4 = MOWBRAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = MOWBRAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = MOWBRAY_Rent_Low_Res
Parcel_Rent_Med_Res_4 = MOWBRAY_Rent_Med_Res
Parcel_Rent_Office_4 = MOWBRAY_Rent_Office
Parcel_Rent_Retail_4 = MOWBRAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = MOWBRAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = MOWBRAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = MOWBRAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = MOWBRAY_Sale_Parking_W_Conc
Suburb_Name_4 = "MOWBRAY"
elif Parcel_Suburb_4 == OBSERVATORY:
Parcel_Land_4 = OBSERVATORY_Land
Parcel_WO_Conc_Sale_4 = OBSERVATORY_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = OBSERVATORY_W_Conc_Sale
Parcel_Muni_4 = OBSERVATORY_Muni
Parcel_Rent_WO_Conc_Res_4 = OBSERVATORY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = OBSERVATORY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = OBSERVATORY_Rent_Low_Res
Parcel_Rent_Med_Res_4 = OBSERVATORY_Rent_Med_Res
Parcel_Rent_Office_4 = OBSERVATORY_Rent_Office
Parcel_Rent_Retail_4 = OBSERVATORY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = OBSERVATORY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = OBSERVATORY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = OBSERVATORY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = OBSERVATORY_Sale_Parking_W_Conc
Suburb_Name_4 = "OBSERVATORY"
elif Parcel_Suburb_4 == ORANJEZICHT:
Parcel_Land_4 = ORANJEZICHT_Land
Parcel_WO_Conc_Sale_4 = ORANJEZICHT_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = ORANJEZICHT_W_Conc_Sale
Parcel_Muni_4 = ORANJEZICHT_Muni
Parcel_Rent_WO_Conc_Res_4 = ORANJEZICHT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = ORANJEZICHT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = ORANJEZICHT_Rent_Low_Res

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Parcel_Rent_Med_Res_4 = ORANJEZICHT_Rent_Med_Res
Parcel_Rent_Office_4 = ORANJEZICHT_Rent_Office
Parcel_Rent_Retail_4 = ORANJEZICHT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = ORANJEZICHT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = ORANJEZICHT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = ORANJEZICHT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = ORANJEZICHT_Sale_Parking_W_Conc
Suburb_Name_4 = "ORANJEZICHT"
elif Parcel_Suburb_4 == PAARDEN_EILAND:
Parcel_Land_4 = PAARDEN_EILAND_Land
Parcel_WO_Conc_Sale_4 = PAARDEN_EILAND_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = PAARDEN_EILAND_W_Conc_Sale
Parcel_Muni_4 = PAARDEN_EILAND_Muni
Parcel_Rent_WO_Conc_Res_4 = PAARDEN_EILAND_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = PAARDEN_EILAND_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = PAARDEN_EILAND_Rent_Low_Res
Parcel_Rent_Med_Res_4 = PAARDEN_EILAND_Rent_Med_Res
Parcel_Rent_Office_4 = PAARDEN_EILAND_Rent_Office
Parcel_Rent_Retail_4 = PAARDEN_EILAND_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = PAARDEN_EILAND_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = PAARDEN_EILAND_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = PAARDEN_EILAND_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = PAARDEN_EILAND_Sale_Parking_W_Conc
Suburb_Name_4 = "PAARDEN_EILAND"
elif Parcel_Suburb_4 == RONDEBOSCH:
Parcel_Land_4 = RONDEBOSCH_Land
Parcel_WO_Conc_Sale_4 = RONDEBOSCH_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = RONDEBOSCH_W_Conc_Sale
Parcel_Muni_4 = RONDEBOSCH_Muni
Parcel_Rent_WO_Conc_Res_4 = RONDEBOSCH_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = RONDEBOSCH_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = RONDEBOSCH_Rent_Low_Res
Parcel_Rent_Med_Res_4 = RONDEBOSCH_Rent_Med_Res
Parcel_Rent_Office_4 = RONDEBOSCH_Rent_Office
Parcel_Rent_Retail_4 = RONDEBOSCH_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = RONDEBOSCH_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = RONDEBOSCH_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = RONDEBOSCH_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = RONDEBOSCH_Sale_Parking_W_Conc
Suburb_Name_4 = "RONDEBOSCH"
elif Parcel_Suburb_4 == ROSEBANK:
Parcel_Land_4 = ROSEBANK_Land
Parcel_WO_Conc_Sale_4 = ROSEBANK_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = ROSEBANK_W_Conc_Sale
Parcel_Muni_4 = ROSEBANK_Muni
Parcel_Rent_WO_Conc_Res_4 = ROSEBANK_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = ROSEBANK_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = ROSEBANK_Rent_Low_Res
Parcel_Rent_Med_Res_4 = ROSEBANK_Rent_Med_Res
Parcel_Rent_Office_4 = ROSEBANK_Rent_Office
Parcel_Rent_Retail_4 = ROSEBANK_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = ROSEBANK_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = ROSEBANK_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = ROSEBANK_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = ROSEBANK_Sale_Parking_W_Conc
Suburb_Name_4 = "ROSEBANK"
elif Parcel_Suburb_4 == SALT_RIVER:
Parcel_Land_4 = SALT_RIVER_Land
Parcel_WO_Conc_Sale_4 = SALT_RIVER_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = SALT_RIVER_W_Conc_Sale
Parcel_Muni_4 = SALT_RIVER_Muni
Parcel_Rent_WO_Conc_Res_4 = SALT_RIVER_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = SALT_RIVER_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = SALT_RIVER_Rent_Low_Res
Parcel_Rent_Med_Res_4 = SALT_RIVER_Rent_Med_Res
Parcel_Rent_Office_4 = SALT_RIVER_Rent_Office

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Parcel_Rent_Retail_4 = SALT_RIVER_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = SALT_RIVER_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = SALT_RIVER_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = SALT_RIVER_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = SALT_RIVER_Sale_Parking_W_Conc
Suburb_Name_4 = "SALT_RIVER"
elif Parcel_Suburb_4 == SCHOTSCHEKLOOF:
Parcel_Land_4 = SCHOTSCHEKLOOF_Land
Parcel_WO_Conc_Sale_4 = SCHOTSCHEKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = SCHOTSCHEKLOOF_W_Conc_Sale
Parcel_Muni_4 = SCHOTSCHEKLOOF_Muni
Parcel_Rent_WO_Conc_Res_4 = SCHOTSCHEKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = SCHOTSCHEKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = SCHOTSCHEKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_4 = SCHOTSCHEKLOOF_Rent_Med_Res
Parcel_Rent_Office_4 = SCHOTSCHEKLOOF_Rent_Office
Parcel_Rent_Retail_4 = SCHOTSCHEKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = SCHOTSCHEKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = SCHOTSCHEKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = SCHOTSCHEKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = SCHOTSCHEKLOOF_Sale_Parking_W_Conc
Suburb_Name_4 = "SCHOTSCHEKLOOF"
elif Parcel_Suburb_4 == SEA_POINT:
Parcel_Land_4 = SEA_POINT_Land
Parcel_WO_Conc_Sale_4 = SEA_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = SEA_POINT_W_Conc_Sale
Parcel_Muni_4 = SEA_POINT_Muni
Parcel_Rent_WO_Conc_Res_4 = SEA_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = SEA_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = SEA_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_4 = SEA_POINT_Rent_Med_Res
Parcel_Rent_Office_4 = SEA_POINT_Rent_Office
Parcel_Rent_Retail_4 = SEA_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = SEA_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = SEA_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = SEA_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = SEA_POINT_Sale_Parking_W_Conc
Suburb_Name_4 = "SEA_POINT"
elif Parcel_Suburb_4 == TAMBOERSKLOOF:
Parcel_Land_4 = TAMBOERSKLOOF_Land
Parcel_WO_Conc_Sale_4 = TAMBOERSKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = TAMBOERSKLOOF_W_Conc_Sale
Parcel_Muni_4 = TAMBOERSKLOOF_Muni
Parcel_Rent_WO_Conc_Res_4 = TAMBOERSKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = TAMBOERSKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = TAMBOERSKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_4 = TAMBOERSKLOOF_Rent_Med_Res
Parcel_Rent_Office_4 = TAMBOERSKLOOF_Rent_Office
Parcel_Rent_Retail_4 = TAMBOERSKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = TAMBOERSKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_4 = TAMBOERSKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = TAMBOERSKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = TAMBOERSKLOOF_Sale_Parking_W_Conc
Suburb_Name_4 = "TAMBOERSKLOOF"
elif Parcel_Suburb_4 == THREE_ANCHOR_BAY:
Parcel_Land_4 = THREE_ANCHOR_BAY_Land
Parcel_WO_Conc_Sale_4 = THREE_ANCHOR_BAY_WO_Conc_Sale
Parcel_W_Conc_Sale_4 = THREE_ANCHOR_BAY_W_Conc_Sale
Parcel_Muni_4 = THREE_ANCHOR_BAY_Muni
Parcel_Rent_WO_Conc_Res_4 = THREE_ANCHOR_BAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_4 = THREE_ANCHOR_BAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_4 = THREE_ANCHOR_BAY_Rent_Low_Res
Parcel_Rent_Med_Res_4 = THREE_ANCHOR_BAY_Rent_Med_Res
Parcel_Rent_Office_4 = THREE_ANCHOR_BAY_Rent_Office
Parcel_Rent_Retail_4 = THREE_ANCHOR_BAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_4 = THREE_ANCHOR_BAY_Rent_Parking_WO_Conc

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Parcel_Rent_Parking_W_Conc_4 = THREE_ANCHOR_BAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_4 = THREE_ANCHOR_BAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_4 = THREE_ANCHOR_BAY_Sale_Parking_W_Conc
Suburb_Name_4 = "THREE_ANCHOR_BAY"
elif Parcel_Suburb_4 == VREDEHOEK:
    Parcel_Land_4 = VREDEHOEK_Land
    Parcel_WO_Conc_Sale_4 = VREDEHOEK_WO_Conc_Sale
    Parcel_W_Conc_Sale_4 = VREDEHOEK_W_Conc_Sale
    Parcel_Muni_4 = VREDEHOEK_Muni
    Parcel_Rent_WO_Conc_Res_4 = VREDEHOEK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_4 = VREDEHOEK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_4 = VREDEHOEK_Rent_Low_Res
    Parcel_Rent_Med_Res_4 = VREDEHOEK_Rent_Med_Res
    Parcel_Rent_Office_4 = VREDEHOEK_Rent_Office
    Parcel_Rent_Retail_4 = VREDEHOEK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_4 = VREDEHOEK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_4 = VREDEHOEK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_4 = VREDEHOEK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_4 = VREDEHOEK_Sale_Parking_W_Conc
    Suburb_Name_4 = "VREDEHOEK"
elif Parcel_Suburb_4 == WOODSTOCK:
    Parcel_Land_4 = WOODSTOCK_Land
    Parcel_WO_Conc_Sale_4 = WOODSTOCK_WO_Conc_Sale
    Parcel_W_Conc_Sale_4 = WOODSTOCK_W_Conc_Sale
    Parcel_Muni_4 = WOODSTOCK_Muni
    Parcel_Rent_WO_Conc_Res_4 = WOODSTOCK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_4 = WOODSTOCK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_4 = WOODSTOCK_Rent_Low_Res
    Parcel_Rent_Med_Res_4 = WOODSTOCK_Rent_Med_Res
    Parcel_Rent_Office_4 = WOODSTOCK_Rent_Office
    Parcel_Rent_Retail_4 = WOODSTOCK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_4 = WOODSTOCK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_4 = WOODSTOCK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_4 = WOODSTOCK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_4 = WOODSTOCK_Sale_Parking_W_Conc
    Suburb_Name_4 = "WOODSTOCK"
elif Parcel_Suburb_4 == ZONNEBLOEM:
    Parcel_Land_4 = ZONNEBLOEM_Land
    Parcel_WO_Conc_Sale_4 = ZONNEBLOEM_WO_Conc_Sale
    Parcel_W_Conc_Sale_4 = ZONNEBLOEM_W_Conc_Sale
    Parcel_Muni_4 = ZONNEBLOEM_Muni
    Parcel_Rent_WO_Conc_Res_4 = ZONNEBLOEM_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_4 = ZONNEBLOEM_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_4 = ZONNEBLOEM_Rent_Low_Res
    Parcel_Rent_Med_Res_4 = ZONNEBLOEM_Rent_Med_Res
    Parcel_Rent_Office_4 = ZONNEBLOEM_Rent_Office
    Parcel_Rent_Retail_4 = ZONNEBLOEM_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_4 = ZONNEBLOEM_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_4 = ZONNEBLOEM_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_4 = ZONNEBLOEM_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_4 = ZONNEBLOEM_Sale_Parking_W_Conc
    Suburb_Name_4 = "ZONNEBLOEM"
else:
    print 'Error Land Parcel 4 Value'

#Land Parcel 5 Vacant Land Price
if Parcel_Suburb_5 == BANTRY_BAY:
    Parcel_Land_5 = BANTRY_BAY_Land
    Parcel_WO_Conc_Sale_5 = BANTRY_BAY_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = BANTRY_BAY_W_Conc_Sale
    Parcel_Muni_5 = BANTRY_BAY_Muni
    Parcel_Rent_WO_Conc_Res_5 = BANTRY_BAY_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = BANTRY_BAY_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = BANTRY_BAY_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = BANTRY_BAY_Rent_Med_Res
    Parcel_Rent_Office_5 = BANTRY_BAY_Rent_Office

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Parcel_Rent_Retail_5 = BANTRY_BAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = BANTRY_BAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = BANTRY_BAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = BANTRY_BAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = BANTRY_BAY_Sale_Parking_W_Conc
Suburb_Name_5 = "BANTRY_BAY"
elif Parcel_Suburb_5 == BROOKLYN:
Parcel_Land_5 = BROOKLYN_Land
Parcel_WO_Conc_Sale_5 = BROOKLYN_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = BROOKLYN_W_Conc_Sale
Parcel_Muni_5 = BROOKLYN_Muni
Parcel_Rent_WO_Conc_Res_5 = BROOKLYN_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = BROOKLYN_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = BROOKLYN_Rent_Low_Res
Parcel_Rent_Med_Res_5 = BROOKLYN_Rent_Med_Res
Parcel_Rent_Office_5 = BROOKLYN_Rent_Office
Parcel_Rent_Retail_5 = BROOKLYN_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = BROOKLYN_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = BROOKLYN_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = BROOKLYN_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = BROOKLYN_Sale_Parking_W_Conc
Suburb_Name_5 = "BROOKLYN"
elif Parcel_Suburb_5 == CAPE_TOWN_CITY_CENTRE:
Parcel_Land_5 = CAPE_TOWN_CITY_CENTRE_Land
Parcel_WO_Conc_Sale_5 = CAPE_TOWN_CITY_CENTRE_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = CAPE_TOWN_CITY_CENTRE_W_Conc_Sale
Parcel_Muni_5 = CAPE_TOWN_CITY_CENTRE_Muni
Parcel_Rent_WO_Conc_Res_5 = CAPE_TOWN_CITY_CENTRE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = CAPE_TOWN_CITY_CENTRE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = CAPE_TOWN_CITY_CENTRE_Rent_Low_Res
Parcel_Rent_Med_Res_5 = CAPE_TOWN_CITY_CENTRE_Rent_Med_Res
Parcel_Rent_Office_5 = CAPE_TOWN_CITY_CENTRE_Rent_Office
Parcel_Rent_Retail_5 = CAPE_TOWN_CITY_CENTRE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = CAPE_TOWN_CITY_CENTRE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = CAPE_TOWN_CITY_CENTRE_Sale_Parking_W_Conc
Suburb_Name_5 = "CAPE_TOWN_CITY_CENTRE"
elif Parcel_Suburb_5 == FORESHORE:
Parcel_Land_5 = FORESHORE_Land
Parcel_WO_Conc_Sale_5 = FORESHORE_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = FORESHORE_W_Conc_Sale
Parcel_Muni_5 = FORESHORE_Muni
Parcel_Rent_WO_Conc_Res_5 = FORESHORE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = FORESHORE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = FORESHORE_Rent_Low_Res
Parcel_Rent_Med_Res_5 = FORESHORE_Rent_Med_Res
Parcel_Rent_Office_5 = FORESHORE_Rent_Office
Parcel_Rent_Retail_5 = FORESHORE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = FORESHORE_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = FORESHORE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = FORESHORE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = FORESHORE_Sale_Parking_W_Conc
Suburb_Name_5 = "FORESHORE"
elif Parcel_Suburb_5 == FRESNAYE:
Parcel_Land_5 = FRESNAYE_Land
Parcel_WO_Conc_Sale_5 = FRESNAYE_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = FRESNAYE_W_Conc_Sale
Parcel_Muni_5 = FRESNAYE_Muni
Parcel_Rent_WO_Conc_Res_5 = FRESNAYE_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = FRESNAYE_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = FRESNAYE_Rent_Low_Res
Parcel_Rent_Med_Res_5 = FRESNAYE_Rent_Med_Res
Parcel_Rent_Office_5 = FRESNAYE_Rent_Office
Parcel_Rent_Retail_5 = FRESNAYE_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = FRESNAYE_Rent_Parking_WO_Conc

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Parcel_Rent_Parking_W_Conc_5 = FRESNAYE_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = FRESNAYE_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = FRESNAYE_Sale_Parking_W_Conc
Suburb_Name_5 = "FRESNAYE"
elif Parcel_Suburb_5 == GARDENS:
    Parcel_Land_5 = GARDENS_Land
    Parcel_WO_Conc_Sale_5 = GARDENS_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = GARDENS_W_Conc_Sale
    Parcel_Muni_5 = GARDENS_Muni
    Parcel_Rent_WO_Conc_Res_5 = GARDENS_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = GARDENS_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = GARDENS_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = GARDENS_Rent_Med_Res
    Parcel_Rent_Office_5 = GARDENS_Rent_Office
    Parcel_Rent_Retail_5 = GARDENS_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = GARDENS_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = GARDENS_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = GARDENS_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = GARDENS_Sale_Parking_W_Conc
    Suburb_Name_5 = "GARDENS"
elif Parcel_Suburb_5 == GREEN_POINT:
    Parcel_Land_5 = GREEN_POINT_Land
    Parcel_WO_Conc_Sale_5 = GREEN_POINT_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = GREEN_POINT_W_Conc_Sale
    Parcel_Muni_5 = GREEN_POINT_Muni
    Parcel_Rent_WO_Conc_Res_5 = GREEN_POINT_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = GREEN_POINT_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = GREEN_POINT_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = GREEN_POINT_Rent_Med_Res
    Parcel_Rent_Office_5 = GREEN_POINT_Rent_Office
    Parcel_Rent_Retail_5 = GREEN_POINT_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = GREEN_POINT_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = GREEN_POINT_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = GREEN_POINT_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = GREEN_POINT_Sale_Parking_W_Conc
    Suburb_Name_5 = "GREEN_POINT"
elif Parcel_Suburb_5 == MAITLAND:
    Parcel_Land_5 = MAITLAND_Land
    Parcel_WO_Conc_Sale_5 = MAITLAND_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = MAITLAND_W_Conc_Sale
    Parcel_Muni_5 = MAITLAND_Muni
    Parcel_Rent_WO_Conc_Res_5 = MAITLAND_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = MAITLAND_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = MAITLAND_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = MAITLAND_Rent_Med_Res
    Parcel_Rent_Office_5 = MAITLAND_Rent_Office
    Parcel_Rent_Retail_5 = MAITLAND_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = MAITLAND_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = MAITLAND_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = MAITLAND_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = MAITLAND_Sale_Parking_W_Conc
    Suburb_Name_5 = "MAITLAND"
elif Parcel_Suburb_5 == MAITLAND_GARDEN_VILLAGE:
    Parcel_Land_5 = MAITLAND_GARDEN_VILLAGE_Land
    Parcel_WO_Conc_Sale_5 = MAITLAND_GARDEN_VILLAGE_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = MAITLAND_GARDEN_VILLAGE_W_Conc_Sale
    Parcel_Muni_5 = MAITLAND_GARDEN_VILLAGE_Muni
    Parcel_Rent_WO_Conc_Res_5 = MAITLAND_GARDEN_VILLAGE_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = MAITLAND_GARDEN_VILLAGE_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = MAITLAND_GARDEN_VILLAGE_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = MAITLAND_GARDEN_VILLAGE_Rent_Med_Res
    Parcel_Rent_Office_5 = MAITLAND_GARDEN_VILLAGE_Rent_Office
    Parcel_Rent_Retail_5 = MAITLAND_GARDEN_VILLAGE_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = MAITLAND_GARDEN_VILLAGE_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_WO_Conc

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Parcel_Sale_Parking_W_Conc_5 = MAITLAND_GARDEN_VILLAGE_Sale_Parking_W_Conc
Suburb_Name_5 = "MAITLAND_GARDEN_VILLAGE"
elif Parcel_Suburb_5 == MOUILLE_POINT:
Parcel_Land_5 = MOUILLE_POINT_Land
Parcel_WO_Conc_Sale_5 = MOUILLE_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = MOUILLE_POINT_W_Conc_Sale
Parcel_Muni_5 = MOUILLE_POINT_Muni
Parcel_Rent_WO_Conc_Res_5 = MOUILLE_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = MOUILLE_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = MOUILLE_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_5 = MOUILLE_POINT_Rent_Med_Res
Parcel_Rent_Office_5 = MOUILLE_POINT_Rent_Office
Parcel_Rent_Retail_5 = MOUILLE_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = MOUILLE_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = MOUILLE_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = MOUILLE_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = MOUILLE_POINT_Sale_Parking_W_Conc
Suburb_Name_5 = "MOUILLE_POINT"
elif Parcel_Suburb_5 == MOWBRAY:
Parcel_Land_5 = MOWBRAY_Land
Parcel_WO_Conc_Sale_5 = MOWBRAY_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = MOWBRAY_W_Conc_Sale
Parcel_Muni_5 = MOWBRAY_Muni
Parcel_Rent_WO_Conc_Res_5 = MOWBRAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = MOWBRAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = MOWBRAY_Rent_Low_Res
Parcel_Rent_Med_Res_5 = MOWBRAY_Rent_Med_Res
Parcel_Rent_Office_5 = MOWBRAY_Rent_Office
Parcel_Rent_Retail_5 = MOWBRAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = MOWBRAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = MOWBRAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = MOWBRAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = MOWBRAY_Sale_Parking_W_Conc
Suburb_Name_5 = "MOWBRAY"
elif Parcel_Suburb_5 == OBSERVATORY:
Parcel_Land_5 = OBSERVATORY_Land
Parcel_WO_Conc_Sale_5 = OBSERVATORY_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = OBSERVATORY_W_Conc_Sale
Parcel_Muni_5 = OBSERVATORY_Muni
Parcel_Rent_WO_Conc_Res_5 = OBSERVATORY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = OBSERVATORY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = OBSERVATORY_Rent_Low_Res
Parcel_Rent_Med_Res_5 = OBSERVATORY_Rent_Med_Res
Parcel_Rent_Office_5 = OBSERVATORY_Rent_Office
Parcel_Rent_Retail_5 = OBSERVATORY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = OBSERVATORY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = OBSERVATORY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = OBSERVATORY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = OBSERVATORY_Sale_Parking_W_Conc
Suburb_Name_5 = "OBSERVATORY"
elif Parcel_Suburb_5 == ORANJEZICHT:
Parcel_Land_5 = ORANJEZICHT_Land
Parcel_WO_Conc_Sale_5 = ORANJEZICHT_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = ORANJEZICHT_W_Conc_Sale
Parcel_Muni_5 = ORANJEZICHT_Muni
Parcel_Rent_WO_Conc_Res_5 = ORANJEZICHT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = ORANJEZICHT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = ORANJEZICHT_Rent_Low_Res
Parcel_Rent_Med_Res_5 = ORANJEZICHT_Rent_Med_Res
Parcel_Rent_Office_5 = ORANJEZICHT_Rent_Office
Parcel_Rent_Retail_5 = ORANJEZICHT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = ORANJEZICHT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = ORANJEZICHT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = ORANJEZICHT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = ORANJEZICHT_Sale_Parking_W_Conc
Suburb_Name_5 = "ORANJEZICHT"

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elif Parcel_Suburb_5 == PAARDEN_EILAND:
    Parcel_Land_5 = PAARDEN_EILAND_Land
    Parcel_WO_Conc_Sale_5 = PAARDEN_EILAND_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = PAARDEN_EILAND_W_Conc_Sale
    Parcel_Muni_5 = PAARDEN_EILAND_Muni
    Parcel_Rent_WO_Conc_Res_5 = PAARDEN_EILAND_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = PAARDEN_EILAND_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = PAARDEN_EILAND_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = PAARDEN_EILAND_Rent_Med_Res
    Parcel_Rent_Office_5 = PAARDEN_EILAND_Rent_Office
    Parcel_Rent_Retail_5 = PAARDEN_EILAND_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = PAARDEN_EILAND_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = PAARDEN_EILAND_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = PAARDEN_EILAND_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = PAARDEN_EILAND_Sale_Parking_W_Conc
    Suburb_Name_5 = "PAARDEN_EILAND"
elif Parcel_Suburb_5 == RONDEBOSCH:
    Parcel_Land_5 = RONDEBOSCH_Land
    Parcel_WO_Conc_Sale_5 = RONDEBOSCH_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = RONDEBOSCH_W_Conc_Sale
    Parcel_Muni_5 = RONDEBOSCH_Muni
    Parcel_Rent_WO_Conc_Res_5 = RONDEBOSCH_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = RONDEBOSCH_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = RONDEBOSCH_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = RONDEBOSCH_Rent_Med_Res
    Parcel_Rent_Office_5 = RONDEBOSCH_Rent_Office
    Parcel_Rent_Retail_5 = RONDEBOSCH_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = RONDEBOSCH_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = RONDEBOSCH_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = RONDEBOSCH_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = RONDEBOSCH_Sale_Parking_W_Conc
    Suburb_Name_5 = "RONDEBOSCH"
elif Parcel_Suburb_5 == ROSEBANK:
    Parcel_Land_5 = ROSEBANK_Land
    Parcel_WO_Conc_Sale_5 = ROSEBANK_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = ROSEBANK_W_Conc_Sale
    Parcel_Muni_5 = ROSEBANK_Muni
    Parcel_Rent_WO_Conc_Res_5 = ROSEBANK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = ROSEBANK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = ROSEBANK_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = ROSEBANK_Rent_Med_Res
    Parcel_Rent_Office_5 = ROSEBANK_Rent_Office
    Parcel_Rent_Retail_5 = ROSEBANK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = ROSEBANK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = ROSEBANK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = ROSEBANK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = ROSEBANK_Sale_Parking_W_Conc
    Suburb_Name_5 = "ROSEBANK"
elif Parcel_Suburb_5 == SALT_RIVER:
    Parcel_Land_5 = SALT_RIVER_Land
    Parcel_WO_Conc_Sale_5 = SALT_RIVER_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = SALT_RIVER_W_Conc_Sale
    Parcel_Muni_5 = SALT_RIVER_Muni
    Parcel_Rent_WO_Conc_Res_5 = SALT_RIVER_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = SALT_RIVER_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = SALT_RIVER_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = SALT_RIVER_Rent_Med_Res
    Parcel_Rent_Office_5 = SALT_RIVER_Rent_Office
    Parcel_Rent_Retail_5 = SALT_RIVER_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = SALT_RIVER_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = SALT_RIVER_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = SALT_RIVER_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = SALT_RIVER_Sale_Parking_W_Conc
    Suburb_Name_5 = "SALT_RIVER"
elif Parcel_Suburb_5 == SCHOTSCHEKLOOF:
    Parcel_Land_5 = SCHOTSCHEKLOOF_Land

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Parcel_WO_Conc_Sale_5 = SCHOTSCHEKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = SCHOTSCHEKLOOF_W_Conc_Sale
Parcel_Muni_5 = SCHOTSCHEKLOOF_Muni
Parcel_Rent_WO_Conc_Res_5 = SCHOTSCHEKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = SCHOTSCHEKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = SCHOTSCHEKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_5 = SCHOTSCHEKLOOF_Rent_Med_Res
Parcel_Rent_Office_5 = SCHOTSCHEKLOOF_Rent_Office
Parcel_Rent_Retail_5 = SCHOTSCHEKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = SCHOTSCHEKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = SCHOTSCHEKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = SCHOTSCHEKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = SCHOTSCHEKLOOF_Sale_Parking_W_Conc
Suburb_Name_5 = "SCHOTSCHEKLOOF"
elif Parcel_Suburb_5 == SEA_POINT:
Parcel_Land_5 = SEA_POINT_Land
Parcel_WO_Conc_Sale_5 = SEA_POINT_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = SEA_POINT_W_Conc_Sale
Parcel_Muni_5 = SEA_POINT_Muni
Parcel_Rent_WO_Conc_Res_5 = SEA_POINT_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = SEA_POINT_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = SEA_POINT_Rent_Low_Res
Parcel_Rent_Med_Res_5 = SEA_POINT_Rent_Med_Res
Parcel_Rent_Office_5 = SEA_POINT_Rent_Office
Parcel_Rent_Retail_5 = SEA_POINT_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = SEA_POINT_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = SEA_POINT_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = SEA_POINT_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = SEA_POINT_Sale_Parking_W_Conc
Suburb_Name_5 = "SEA_POINT"
elif Parcel_Suburb_5 == TAMBOERSKLOOF:
Parcel_Land_5 = TAMBOERSKLOOF_Land
Parcel_WO_Conc_Sale_5 = TAMBOERSKLOOF_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = TAMBOERSKLOOF_W_Conc_Sale
Parcel_Muni_5 = TAMBOERSKLOOF_Muni
Parcel_Rent_WO_Conc_Res_5 = TAMBOERSKLOOF_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = TAMBOERSKLOOF_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = TAMBOERSKLOOF_Rent_Low_Res
Parcel_Rent_Med_Res_5 = TAMBOERSKLOOF_Rent_Med_Res
Parcel_Rent_Office_5 = TAMBOERSKLOOF_Rent_Office
Parcel_Rent_Retail_5 = TAMBOERSKLOOF_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = TAMBOERSKLOOF_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = TAMBOERSKLOOF_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = TAMBOERSKLOOF_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = TAMBOERSKLOOF_Sale_Parking_W_Conc
Suburb_Name_5 = "TAMBOERSKLOOF"
elif Parcel_Suburb_5 == THREE_ANCHOR_BAY:
Parcel_Land_5 = THREE_ANCHOR_BAY_Land
Parcel_WO_Conc_Sale_5 = THREE_ANCHOR_BAY_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = THREE_ANCHOR_BAY_W_Conc_Sale
Parcel_Muni_5 = THREE_ANCHOR_BAY_Muni
Parcel_Rent_WO_Conc_Res_5 = THREE_ANCHOR_BAY_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = THREE_ANCHOR_BAY_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = THREE_ANCHOR_BAY_Rent_Low_Res
Parcel_Rent_Med_Res_5 = THREE_ANCHOR_BAY_Rent_Med_Res
Parcel_Rent_Office_5 = THREE_ANCHOR_BAY_Rent_Office
Parcel_Rent_Retail_5 = THREE_ANCHOR_BAY_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = THREE_ANCHOR_BAY_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = THREE_ANCHOR_BAY_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = THREE_ANCHOR_BAY_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = THREE_ANCHOR_BAY_Sale_Parking_W_Conc
Suburb_Name_5 = "THREE_ANCHOR_BAY"
elif Parcel_Suburb_5 == VREDEHOEK:
Parcel_Land_5 = VREDEHOEK_Land
Parcel_WO_Conc_Sale_5 = VREDEHOEK_WO_Conc_Sale
Parcel_W_Conc_Sale_5 = VREDEHOEK_W_Conc_Sale

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Parcel_Muni_5 = VREDEHOEK_Muni
Parcel_Rent_WO_Conc_Res_5 = VREDEHOEK_Rent_WO_Conc_Res
Parcel_Rent_W_Conc_Res_5 = VREDEHOEK_Rent_W_Conc_Res
Parcel_Rent_Low_Res_5 = VREDEHOEK_Rent_Low_Res
Parcel_Rent_Med_Res_5 = VREDEHOEK_Rent_Med_Res
Parcel_Rent_Office_5 = VREDEHOEK_Rent_Office
Parcel_Rent_Retail_5 = VREDEHOEK_Rent_Retail
Parcel_Rent_Parking_WO_Conc_5 = VREDEHOEK_Rent_Parking_WO_Conc
Parcel_Rent_Parking_W_Conc_5 = VREDEHOEK_Rent_Parking_W_Conc
Parcel_Sale_Parking_WO_Conc_5 = VREDEHOEK_Sale_Parking_WO_Conc
Parcel_Sale_Parking_W_Conc_5 = VREDEHOEK_Sale_Parking_W_Conc
Suburb_Name_5 = "VREDEHOEK"
elif Parcel_Suburb_5 == WOODSTOCK:
    Parcel_Land_5 = WOODSTOCK_Land
    Parcel_WO_Conc_Sale_5 = WOODSTOCK_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = WOODSTOCK_W_Conc_Sale
    Parcel_Muni_5 = WOODSTOCK_Muni
    Parcel_Rent_WO_Conc_Res_5 = WOODSTOCK_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = WOODSTOCK_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = WOODSTOCK_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = WOODSTOCK_Rent_Med_Res
    Parcel_Rent_Office_5 = WOODSTOCK_Rent_Office
    Parcel_Rent_Retail_5 = WOODSTOCK_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = WOODSTOCK_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = WOODSTOCK_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = WOODSTOCK_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = WOODSTOCK_Sale_Parking_W_Conc
    Suburb_Name_5 = "WOODSTOCK"
elif Parcel_Suburb_5 == ZONNEBLOEM:
    Parcel_Land_5 = ZONNEBLOEM_Land
    Parcel_WO_Conc_Sale_5 = ZONNEBLOEM_WO_Conc_Sale
    Parcel_W_Conc_Sale_5 = ZONNEBLOEM_W_Conc_Sale
    Parcel_Muni_5 = ZONNEBLOEM_Muni
    Parcel_Rent_WO_Conc_Res_5 = ZONNEBLOEM_Rent_WO_Conc_Res
    Parcel_Rent_W_Conc_Res_5 = ZONNEBLOEM_Rent_W_Conc_Res
    Parcel_Rent_Low_Res_5 = ZONNEBLOEM_Rent_Low_Res
    Parcel_Rent_Med_Res_5 = ZONNEBLOEM_Rent_Med_Res
    Parcel_Rent_Office_5 = ZONNEBLOEM_Rent_Office
    Parcel_Rent_Retail_5 = ZONNEBLOEM_Rent_Retail
    Parcel_Rent_Parking_WO_Conc_5 = ZONNEBLOEM_Rent_Parking_WO_Conc
    Parcel_Rent_Parking_W_Conc_5 = ZONNEBLOEM_Rent_Parking_W_Conc
    Parcel_Sale_Parking_WO_Conc_5 = ZONNEBLOEM_Sale_Parking_WO_Conc
    Parcel_Sale_Parking_W_Conc_5 = ZONNEBLOEM_Sale_Parking_W_Conc
    Suburb_Name_5 = "ZONNEBLOEM"
else:
    print 'Error Land Parcel 5 Value'

print 'Parcel_Land_1:', Parcel_Land_1
print Parcel_WO_Conc_Sale_1
print Parcel_W_Conc_Sale_1
print Parcel_Muni_1
print Parcel_Rent_WO_Conc_Res_1
print Parcel_Rent_W_Conc_Res_1
print Parcel_Rent_Low_Res_1
print Parcel_Rent_Med_Res_1
print Parcel_Rent_Office_1
print Parcel_Rent_Retail_1
print Parcel_Rent_Parking_WO_Conc_1
print Parcel_Rent_Parking_W_Conc_1
print Parcel_Sale_Parking_WO_Conc_1
print Parcel_Sale_Parking_W_Conc_1

```

Module E – Parking Calculations

```
def main():
    pass

if __name__ == '__main__':
    main()

from Site_Configs_v2 import*
from Raster_Data_Extract_v1 import*
from Initial_Site_Calculations_v1 import*

#Initilise Parking Bay Variables:
Park_Bay_Res_WO_Conc_1 = 0
Park_Bay_Office_WO_Conc_1 = 0
Park_Bay_Retail_WO_Conc_1 = 0
Park_Bay_Res_WO_Conc_2 = 0
Park_Bay_Office_WO_Conc_2 = 0
Park_Bay_Retail_WO_Conc_2 = 0
Park_Bay_Res_WO_Conc_3 = 0
Park_Bay_Office_WO_Conc_3 = 0
Park_Bay_Retail_WO_Conc_3 = 0
Park_Bay_Res_WO_Conc_4 = 0
Park_Bay_Office_WO_Conc_4 = 0
Park_Bay_Retail_WO_Conc_4 = 0
Park_Bay_Res_WO_Conc_5 = 0
Park_Bay_Office_WO_Conc_5 = 0
Park_Bay_Retail_WO_Conc_5 = 0

#Zone 1 No Concession Parking Calculations
if 'SR1' in Parcel_Zone_1:
    if Parcel_Parking_Zone_1 == 0:
        if Parcel_Size_1 < 350:
            Park_Bay_Res_WO_Conc_1 = 1
            Park_Bay_Office_WO_Conc_1 = 0
            Park_Bay_Retail_WO_Conc_1 = 0
        elif Parcel_Size_1 >= 350:
            Park_Bay_Res_WO_Conc_1 = 2
            Park_Bay_Office_WO_Conc_1 = 0
            Park_Bay_Retail_WO_Conc_1 = 0
        else:
            print 'ErrorSR1-1'
    elif Parcel_Parking_Zone_1 == 'PT1':
        Park_Bay_Res_WO_Conc_1 = 1
        Park_Bay_Office_WO_Conc_1 = 0
        Park_Bay_Retail_WO_Conc_1 = 0
    elif Parcel_Parking_Zone_1 == 'PT2':
        Park_Bay_Res_WO_Conc_1 = 0
        Park_Bay_Office_WO_Conc_1 = 0
        Park_Bay_Retail_WO_Conc_1 = 0
    else:
        print 'ErrorSR1-2'
elif 'SR2' in Parcel_Zone_1:
    if Parcel_Parking_Zone_1 == 0:
        if Parcel_Size_1 < 100:
            Park_Bay_Res_WO_Conc_1 = 0
            Park_Bay_Office_WO_Conc_1 = 0
            Park_Bay_Retail_WO_Conc_1 = 0
        elif Parcel_Size_1 >= 100:
            Park_Bay_Res_WO_Conc_1 = 1
            Park_Bay_Office_WO_Conc_1 = 0
            Park_Bay_Retail_WO_Conc_1 = 0
        else:
            print 'ErrorSR2-1'
    elif Parcel_Parking_Zone_1 == 'PT1':
```

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    Park_Bay_Res_WO_Conc_1 = 0
    Park_Bay_Office_WO_Conc_1 = 0
    Park_Bay_Retail_WO_Conc_1 = 0
elif Parcel_Parking_Zone_1 == 'PT2':
    Park_Bay_Res_WO_Conc_1 = 0
    Park_Bay_Office_WO_Conc_1 = 0
    Park_Bay_Retail_WO_Conc_1 = 0
else:
    print 'Error SR2-2'
elif 'GR' in Parcel_Zone_1:
    if Parcel_Parking_Zone_1 == 0:
        Park_Bay_Res_WO_Conc_1 = 2
        Park_Bay_Office_WO_Conc_1 = 0
        Park_Bay_Retail_WO_Conc_1 = 0
    elif Parcel_Parking_Zone_1 == 'PT1':
        Park_Bay_Res_WO_Conc_1 = 1.25
        Park_Bay_Office_WO_Conc_1 = 0
        Park_Bay_Retail_WO_Conc_1 = 0
    elif Parcel_Parking_Zone_1 == 'PT2':
        Park_Bay_Res_WO_Conc_1 = 1
        Park_Bay_Office_WO_Conc_1 = 0
        Park_Bay_Retail_WO_Conc_1 = 0
    else:
        print 'Error GR-1'
elif 'LB1' in Parcel_Zone_1:
    if Parcel_Parking_Zone_1 == 0:
        Park_Bay_Res_WO_Conc_1 = 2
        Park_Bay_Office_WO_Conc_1 = 4
        Park_Bay_Retail_WO_Conc_1 = 0
    elif Parcel_Parking_Zone_1 == 'PT1':
        Park_Bay_Res_WO_Conc_1 = 1.25
        Park_Bay_Office_WO_Conc_1 = 2.5
        Park_Bay_Retail_WO_Conc_1 = 0
    elif Parcel_Parking_Zone_1 == 'PT2':
        Park_Bay_Res_WO_Conc_1 = 1
        Park_Bay_Office_WO_Conc_1 = 1
        Park_Bay_Retail_WO_Conc_1 = 0
    else:
        print 'Error LB1-1'
elif 'LB2' in Parcel_Zone_1:
    if Parcel_Parking_Zone_1 == 0:
        Park_Bay_Res_WO_Conc_1 = 2
        Park_Bay_Office_WO_Conc_1 = 0
        Park_Bay_Retail_WO_Conc_1 = 4
    elif Parcel_Parking_Zone_1 == 'PT1':
        Park_Bay_Res_WO_Conc_1 = 1.25
        Park_Bay_Office_WO_Conc_1 = 0
        Park_Bay_Retail_WO_Conc_1 = 2
    elif Parcel_Parking_Zone_1 == 'PT2':
        Park_Bay_Res_WO_Conc_1 = 1
        Park_Bay_Office_WO_Conc_1 = 0
        Park_Bay_Retail_WO_Conc_1 = 1
    else:
        print 'Error LB2-1'
elif 'GB' in Parcel_Zone_1:
    if Parcel_Parking_Zone_1 == 0:
        Park_Bay_Res_WO_Conc_1 = 2
        Park_Bay_Office_WO_Conc_1 = 4
        Park_Bay_Retail_WO_Conc_1 = 4
    elif Parcel_Parking_Zone_1 == 'PT1':
        Park_Bay_Res_WO_Conc_1 = 1.25
        Park_Bay_Office_WO_Conc_1 = 2.5
        Park_Bay_Retail_WO_Conc_1 = 2
    elif Parcel_Parking_Zone_1 == 'PT2':
        Park_Bay_Res_WO_Conc_1 = 1
        Park_Bay_Office_WO_Conc_1 = 1

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    Park_Bay_Retail_WO_Conc_1 = 1
else:
    print 'Error GB-1'
elif 'MU' in Parcel_Zone_1:
    if Parcel_Parking_Zone_1 == 0:
        Park_Bay_Res_WO_Conc_1 = 2
        Park_Bay_Office_WO_Conc_1 = 4
        Park_Bay_Retail_WO_Conc_1 = 4
    elif Parcel_Parking_Zone_1 == 'PT1':
        Park_Bay_Res_WO_Conc_1 = 1.25
        Park_Bay_Office_WO_Conc_1 = 2.5
        Park_Bay_Retail_WO_Conc_1 = 2
    elif Parcel_Parking_Zone_1 == 'PT2':
        Park_Bay_Res_WO_Conc_1 = 1
        Park_Bay_Office_WO_Conc_1 = 1
        Park_Bay_Retail_WO_Conc_1 = 1
    else:
        print 'Error MU-1'
elif 'GI' in Parcel_Zone_1:
    if Parcel_Parking_Zone_1 == 0:
        Park_Bay_Res_WO_Conc_1 = 0
        Park_Bay_Office_WO_Conc_1 = 4
        Park_Bay_Retail_WO_Conc_1 = 4
    elif Parcel_Parking_Zone_1 == 'PT1':
        Park_Bay_Res_WO_Conc_1 = 0
        Park_Bay_Office_WO_Conc_1 = 2.5
        Park_Bay_Retail_WO_Conc_1 = 2
    elif Parcel_Parking_Zone_1 == 'PT2':
        Park_Bay_Res_WO_Conc_1 = 0
        Park_Bay_Office_WO_Conc_1 = 1
        Park_Bay_Retail_WO_Conc_1 = 1
    else:
        print 'Error GI-1'

#Zone 2 No Concession Parking Calculations
if 'SR1' in Parcel_Zone_2:
    if Parcel_Parking_Zone_2 == 0:
        if Parcel_Size_2 < 350:
            Park_Bay_Res_WO_Conc_2 = 1
            Park_Bay_Office_WO_Conc_2 = 0
            Park_Bay_Retail_WO_Conc_2 = 0
        elif Parcel_Size_2 >= 350:
            Park_Bay_Res_WO_Conc_2 = 2
            Park_Bay_Office_WO_Conc_2 = 0
            Park_Bay_Retail_WO_Conc_2 = 0
        else:
            print 'ErrorSR1-1'
    elif Parcel_Parking_Zone_2 == 'PT1':
        Park_Bay_Res_WO_Conc_2 = 1
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 0
    elif Parcel_Parking_Zone_2 == 'PT2':
        Park_Bay_Res_WO_Conc_2 = 0
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 0
    else:
        print 'ErrorSR1-2'
elif 'SR2' in Parcel_Zone_2:
    if Parcel_Parking_Zone_2 == 0:
        if Parcel_Size_2 < 100:
            Park_Bay_Res_WO_Conc_2 = 0
            Park_Bay_Office_WO_Conc_2 = 0
            Park_Bay_Retail_WO_Conc_2 = 0
        elif Parcel_Size_2 >= 100:
            Park_Bay_Res_WO_Conc_2 = 1
            Park_Bay_Office_WO_Conc_2 = 0

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        Park_Bay_Retail_WO_Conc_2 = 0
    else:
        print 'ErrorSR2-1'
    elif Parcel_Parking_Zone_2 == 'PT1':
        Park_Bay_Res_WO_Conc_2 = 0
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 0
    elif Parcel_Parking_Zone_2 == 'PT2':
        Park_Bay_Res_WO_Conc_2 = 0
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 0
    else:
        print 'Error SR2-2'
elif 'GR' in Parcel_Zone_2:
    if Parcel_Parking_Zone_2 == 0:
        Park_Bay_Res_WO_Conc_2 = 2
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 0
    elif Parcel_Parking_Zone_2 == 'PT1':
        Park_Bay_Res_WO_Conc_2 = 1.25
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 0
    elif Parcel_Parking_Zone_2 == 'PT2':
        Park_Bay_Res_WO_Conc_2 = 1
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 0
    else:
        print 'Error GR-1'
elif 'LB1' in Parcel_Zone_2:
    if Parcel_Parking_Zone_2 == 0:
        Park_Bay_Res_WO_Conc_2 = 2
        Park_Bay_Office_WO_Conc_2 = 4
        Park_Bay_Retail_WO_Conc_2 = 0
    elif Parcel_Parking_Zone_2 == 'PT1':
        Park_Bay_Res_WO_Conc_2 = 1.25
        Park_Bay_Office_WO_Conc_2 = 2.5
        Park_Bay_Retail_WO_Conc_2 = 0
    elif Parcel_Parking_Zone_2 == 'PT2':
        Park_Bay_Res_WO_Conc_2 = 1
        Park_Bay_Office_WO_Conc_2 = 1
        Park_Bay_Retail_WO_Conc_2 = 0
    else:
        print 'Error LB1-1'
elif 'LB2' in Parcel_Zone_2:
    if Parcel_Parking_Zone_2 == 0:
        Park_Bay_Res_WO_Conc_2 = 2
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 4
    elif Parcel_Parking_Zone_2 == 'PT1':
        Park_Bay_Res_WO_Conc_2 = 1.25
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 2
    elif Parcel_Parking_Zone_2 == 'PT2':
        Park_Bay_Res_WO_Conc_2 = 1
        Park_Bay_Office_WO_Conc_2 = 0
        Park_Bay_Retail_WO_Conc_2 = 1
    else:
        print 'Error LB2-1'
elif 'GB' in Parcel_Zone_2:
    if Parcel_Parking_Zone_2 == 0:
        Park_Bay_Res_WO_Conc_2 = 2
        Park_Bay_Office_WO_Conc_2 = 4
        Park_Bay_Retail_WO_Conc_2 = 4
    elif Parcel_Parking_Zone_2 == 'PT1':
        Park_Bay_Res_WO_Conc_2 = 1.25
        Park_Bay_Office_WO_Conc_2 = 2.5

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    Park_Bay_Retail_WO_Conc_2 = 2
elif Parcel_Parking_Zone_2 == 'PT2':
    Park_Bay_Res_WO_Conc_2 = 1
    Park_Bay_Office_WO_Conc_2 = 1
    Park_Bay_Retail_WO_Conc_2 = 1
else:
    print 'Error GB-1'
elif 'MU' in Parcel_Zone_2:
    if Parcel_Parking_Zone_2 == 0:
        Park_Bay_Res_WO_Conc_2 = 2
        Park_Bay_Office_WO_Conc_2 = 4
        Park_Bay_Retail_WO_Conc_2 = 4
    elif Parcel_Parking_Zone_2 == 'PT1':
        Park_Bay_Res_WO_Conc_2 = 1.25
        Park_Bay_Office_WO_Conc_2 = 2.5
        Park_Bay_Retail_WO_Conc_2 = 2
    elif Parcel_Parking_Zone_2 == 'PT2':
        Park_Bay_Res_WO_Conc_2 = 1
        Park_Bay_Office_WO_Conc_2 = 1
        Park_Bay_Retail_WO_Conc_2 = 1
    else:
        print 'Error MU-1'
elif 'GI' in Parcel_Zone_2:
    if Parcel_Parking_Zone_2 == 0:
        Park_Bay_Res_WO_Conc_2 = 0
        Park_Bay_Office_WO_Conc_2 = 4
        Park_Bay_Retail_WO_Conc_2 = 4
    elif Parcel_Parking_Zone_2 == 'PT1':
        Park_Bay_Res_WO_Conc_2 = 0
        Park_Bay_Office_WO_Conc_2 = 2.5
        Park_Bay_Retail_WO_Conc_2 = 2
    elif Parcel_Parking_Zone_2 == 'PT2':
        Park_Bay_Res_WO_Conc_2 = 0
        Park_Bay_Office_WO_Conc_2 = 1
        Park_Bay_Retail_WO_Conc_2 = 1
    else:
        print 'Error GI-1'

#Zone 3 No Concession Parking Calculations
if 'SR1' in Parcel_Zone_3:
    if Parcel_Parking_Zone_3 == 0:
        if Parcel_Size_3 < 350:
            Park_Bay_Res_WO_Conc_3 = 1
            Park_Bay_Office_WO_Conc_3 = 0
            Park_Bay_Retail_WO_Conc_3 = 0
        elif Parcel_Size_3 >= 350:
            Park_Bay_Res_WO_Conc_3 = 2
            Park_Bay_Office_WO_Conc_3 = 0
            Park_Bay_Retail_WO_Conc_3 = 0
        else:
            print 'ErrorSR1-1'
    elif Parcel_Parking_Zone_3 == 'PT1':
        Park_Bay_Res_WO_Conc_3 = 1
        Park_Bay_Office_WO_Conc_3 = 0
        Park_Bay_Retail_WO_Conc_3 = 0
    elif Parcel_Parking_Zone_3 == 'PT2':
        Park_Bay_Res_WO_Conc_3 = 0
        Park_Bay_Office_WO_Conc_3 = 0
        Park_Bay_Retail_WO_Conc_3 = 0
    else:
        print 'ErrorSR1-2'
elif 'SR2' in Parcel_Zone_3:
    if Parcel_Parking_Zone_3 == 0:
        if Parcel_Size_3 < 100:
            Park_Bay_Res_WO_Conc_3 = 0
            Park_Bay_Office_WO_Conc_3 = 0

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    Park_Bay_Retail_WO_Conc_3 = 0
elif Parcel_Size_3 >= 100:
    Park_Bay_Res_WO_Conc_3 = 1
    Park_Bay_Office_WO_Conc_3 = 0
    Park_Bay_Retail_WO_Conc_3 = 0
else:
    print 'ErrorSR2-1'
elif Parcel_Parking_Zone_3 == 'PT1':
    Park_Bay_Res_WO_Conc_3 = 0
    Park_Bay_Office_WO_Conc_3 = 0
    Park_Bay_Retail_WO_Conc_3 = 0
elif Parcel_Parking_Zone_3 == 'PT2':
    Park_Bay_Res_WO_Conc_3 = 0
    Park_Bay_Office_WO_Conc_3 = 0
    Park_Bay_Retail_WO_Conc_3 = 0
else:
    print 'Error SR2-2'
elif 'GR' in Parcel_Zone_3:
    if Parcel_Parking_Zone_3 == 0:
        Park_Bay_Res_WO_Conc_3 = 2
        Park_Bay_Office_WO_Conc_3 = 0
        Park_Bay_Retail_WO_Conc_3 = 0
    elif Parcel_Parking_Zone_3 == 'PT1':
        Park_Bay_Res_WO_Conc_3 = 1.25
        Park_Bay_Office_WO_Conc_3 = 0
        Park_Bay_Retail_WO_Conc_3 = 0
    elif Parcel_Parking_Zone_3 == 'PT2':
        Park_Bay_Res_WO_Conc_3 = 1
        Park_Bay_Office_WO_Conc_3 = 0
        Park_Bay_Retail_WO_Conc_3 = 0
    else:
        print 'Error GR-1'
elif 'LB1' in Parcel_Zone_3:
    if Parcel_Parking_Zone_3 == 0:
        Park_Bay_Res_WO_Conc_3 = 2
        Park_Bay_Office_WO_Conc_3 = 4
        Park_Bay_Retail_WO_Conc_3 = 0
    elif Parcel_Parking_Zone_3 == 'PT1':
        Park_Bay_Res_WO_Conc_3 = 1.25
        Park_Bay_Office_WO_Conc_3 = 2.5
        Park_Bay_Retail_WO_Conc_3 = 0
    elif Parcel_Parking_Zone_3 == 'PT2':
        Park_Bay_Res_WO_Conc_3 = 1
        Park_Bay_Office_WO_Conc_3 = 1
        Park_Bay_Retail_WO_Conc_3 = 0
    else:
        print 'Error LB1-1'
elif 'LB2' in Parcel_Zone_3:
    if Parcel_Parking_Zone_3 == 0:
        Park_Bay_Res_WO_Conc_3 = 2
        Park_Bay_Office_WO_Conc_3 = 0
        Park_Bay_Retail_WO_Conc_3 = 4
    elif Parcel_Parking_Zone_3 == 'PT1':
        Park_Bay_Res_WO_Conc_3 = 1.25
        Park_Bay_Office_WO_Conc_3 = 0
        Park_Bay_Retail_WO_Conc_3 = 2
    elif Parcel_Parking_Zone_3 == 'PT2':
        Park_Bay_Res_WO_Conc_3 = 1
        Park_Bay_Office_WO_Conc_3 = 0
        Park_Bay_Retail_WO_Conc_3 = 1
    else:
        print 'Error LB2-1'
elif 'GB' in Parcel_Zone_3:
    if Parcel_Parking_Zone_3 == 0:
        Park_Bay_Res_WO_Conc_3 = 2
        Park_Bay_Office_WO_Conc_3 = 4

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    Park_Bay_Retail_WO_Conc_3 = 4
elif Parcel_Parking_Zone_3 == 'PT1':
    Park_Bay_Res_WO_Conc_3 = 1.25
    Park_Bay_Office_WO_Conc_3 = 2.5
    Park_Bay_Retail_WO_Conc_3 = 2
elif Parcel_Parking_Zone_3 == 'PT2':
    Park_Bay_Res_WO_Conc_3 = 1
    Park_Bay_Office_WO_Conc_3 = 1
    Park_Bay_Retail_WO_Conc_3 = 1
else:
    print 'Error GB-1'
elif 'MU' in Parcel_Zone_3:
    if Parcel_Parking_Zone_3 == 0:
        Park_Bay_Res_WO_Conc_3 = 2
        Park_Bay_Office_WO_Conc_3 = 4
        Park_Bay_Retail_WO_Conc_3 = 4
    elif Parcel_Parking_Zone_3 == 'PT1':
        Park_Bay_Res_WO_Conc_3 = 1.25
        Park_Bay_Office_WO_Conc_3 = 2.5
        Park_Bay_Retail_WO_Conc_3 = 2
    elif Parcel_Parking_Zone_3 == 'PT2':
        Park_Bay_Res_WO_Conc_3 = 1
        Park_Bay_Office_WO_Conc_3 = 1
        Park_Bay_Retail_WO_Conc_3 = 1
    else:
        print 'Error MU-1'
elif 'GI' in Parcel_Zone_3:
    if Parcel_Parking_Zone_3 == 0:
        Park_Bay_Res_WO_Conc_3 = 0
        Park_Bay_Office_WO_Conc_3 = 4
        Park_Bay_Retail_WO_Conc_3 = 4
    elif Parcel_Parking_Zone_3 == 'PT1':
        Park_Bay_Res_WO_Conc_3 = 0
        Park_Bay_Office_WO_Conc_3 = 2.5
        Park_Bay_Retail_WO_Conc_3 = 2
    elif Parcel_Parking_Zone_3 == 'PT2':
        Park_Bay_Res_WO_Conc_3 = 0
        Park_Bay_Office_WO_Conc_3 = 1
        Park_Bay_Retail_WO_Conc_3 = 1
    else:
        print 'Error GI-1'

#Zone 4 No Concession Parking Calculations
if 'SR1' in Parcel_Zone_4:
    if Parcel_Parking_Zone_4 == 0:
        if Parcel_Size_4 < 350:
            Park_Bay_Res_WO_Conc_4 = 1
            Park_Bay_Office_WO_Conc_4 = 0
            Park_Bay_Retail_WO_Conc_4 = 0
        elif Parcel_Size_4 >= 350:
            Park_Bay_Res_WO_Conc_4 = 2
            Park_Bay_Office_WO_Conc_4 = 0
            Park_Bay_Retail_WO_Conc_4 = 0
    else:
        print 'ErrorSR1-1'
    elif Parcel_Parking_Zone_4 == 'PT1':
        Park_Bay_Res_WO_Conc_4 = 1
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 0
    elif Parcel_Parking_Zone_4 == 'PT2':
        Park_Bay_Res_WO_Conc_4 = 0
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 0
    else:
        print 'ErrorSR1-2'
elif 'SR2' in Parcel_Zone_4:

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if Parcel_Parking_Zone_4 == 0:
    if Parcel_Size_4 < 100:
        Park_Bay_Res_WO_Conc_4 = 0
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 0
    elif Parcel_Size_4 >= 100:
        Park_Bay_Res_WO_Conc_4 = 1
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 0
    else:
        print 'ErrorSR2-1'
elif Parcel_Parking_Zone_4 == 'PT1':
    Park_Bay_Res_WO_Conc_4 = 0
    Park_Bay_Office_WO_Conc_4 = 0
    Park_Bay_Retail_WO_Conc_4 = 0
elif Parcel_Parking_Zone_4 == 'PT2':
    Park_Bay_Res_WO_Conc_4 = 0
    Park_Bay_Office_WO_Conc_4 = 0
    Park_Bay_Retail_WO_Conc_4 = 0
else:
    print 'Error SR2-2'
elif 'GR' in Parcel_Zone_4:
    if Parcel_Parking_Zone_4 == 0:
        Park_Bay_Res_WO_Conc_4 = 2
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 0
    elif Parcel_Parking_Zone_4 == 'PT1':
        Park_Bay_Res_WO_Conc_4 = 1.25
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 0
    elif Parcel_Parking_Zone_4 == 'PT2':
        Park_Bay_Res_WO_Conc_4 = 1
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 0
    else:
        print 'Error GR-1'
elif 'LB1' in Parcel_Zone_4:
    if Parcel_Parking_Zone_4 == 0:
        Park_Bay_Res_WO_Conc_4 = 2
        Park_Bay_Office_WO_Conc_4 = 4
        Park_Bay_Retail_WO_Conc_4 = 0
    elif Parcel_Parking_Zone_4 == 'PT1':
        Park_Bay_Res_WO_Conc_4 = 1.25
        Park_Bay_Office_WO_Conc_4 = 2.5
        Park_Bay_Retail_WO_Conc_4 = 0
    elif Parcel_Parking_Zone_4 == 'PT2':
        Park_Bay_Res_WO_Conc_4 = 1
        Park_Bay_Office_WO_Conc_4 = 1
        Park_Bay_Retail_WO_Conc_4 = 0
    else:
        print 'Error LB1-1'
elif 'LB2' in Parcel_Zone_4:
    if Parcel_Parking_Zone_4 == 0:
        Park_Bay_Res_WO_Conc_4 = 2
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 4
    elif Parcel_Parking_Zone_4 == 'PT1':
        Park_Bay_Res_WO_Conc_4 = 1.25
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 2
    elif Parcel_Parking_Zone_4 == 'PT2':
        Park_Bay_Res_WO_Conc_4 = 1
        Park_Bay_Office_WO_Conc_4 = 0
        Park_Bay_Retail_WO_Conc_4 = 1
    else:
        print 'Error LB2-1'

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elif 'GB' in Parcel_Zone_4:
    if Parcel_Parking_Zone_4 == 0:
        Park_Bay_Res_WO_Conc_4 = 2
        Park_Bay_Office_WO_Conc_4 = 4
        Park_Bay_Retail_WO_Conc_4 = 4
    elif Parcel_Parking_Zone_4 == 'PT1':
        Park_Bay_Res_WO_Conc_4 = 1.25
        Park_Bay_Office_WO_Conc_4 = 2.5
        Park_Bay_Retail_WO_Conc_4 = 2
    elif Parcel_Parking_Zone_4 == 'PT2':
        Park_Bay_Res_WO_Conc_4 = 1
        Park_Bay_Office_WO_Conc_4 = 1
        Park_Bay_Retail_WO_Conc_4 = 1
    else:
        print 'Error GB-1'
elif 'MU' in Parcel_Zone_4:
    if Parcel_Parking_Zone_4 == 0:
        Park_Bay_Res_WO_Conc_4 = 2
        Park_Bay_Office_WO_Conc_4 = 4
        Park_Bay_Retail_WO_Conc_4 = 4
    elif Parcel_Parking_Zone_4 == 'PT1':
        Park_Bay_Res_WO_Conc_4 = 1.25
        Park_Bay_Office_WO_Conc_4 = 2.5
        Park_Bay_Retail_WO_Conc_4 = 2
    elif Parcel_Parking_Zone_4 == 'PT2':
        Park_Bay_Res_WO_Conc_4 = 1
        Park_Bay_Office_WO_Conc_4 = 1
        Park_Bay_Retail_WO_Conc_4 = 1
    else:
        print 'Error MU-1'
elif 'GI' in Parcel_Zone_4:
    if Parcel_Parking_Zone_4 == 0:
        Park_Bay_Res_WO_Conc_4 = 0
        Park_Bay_Office_WO_Conc_4 = 4
        Park_Bay_Retail_WO_Conc_4 = 4
    elif Parcel_Parking_Zone_4 == 'PT1':
        Park_Bay_Res_WO_Conc_4 = 0
        Park_Bay_Office_WO_Conc_4 = 2.5
        Park_Bay_Retail_WO_Conc_4 = 2
    elif Parcel_Parking_Zone_4 == 'PT2':
        Park_Bay_Res_WO_Conc_4 = 0
        Park_Bay_Office_WO_Conc_4 = 1
        Park_Bay_Retail_WO_Conc_4 = 1
    else:
        print 'Error GI-1'

#Zone 5 No Concession Parking Calculations
if 'SR1' in Parcel_Zone_5:
    if Parcel_Parking_Zone_5 == 0:
        if Parcel_Size_5 < 350:
            Park_Bay_Res_WO_Conc_5 = 1
            Park_Bay_Office_WO_Conc_5 = 0
            Park_Bay_Retail_WO_Conc_5 = 0
        elif Parcel_Size_5 >= 350:
            Park_Bay_Res_WO_Conc_5 = 2
            Park_Bay_Office_WO_Conc_5 = 0
            Park_Bay_Retail_WO_Conc_5 = 0
        else:
            print 'ErrorSR1-1'
    elif Parcel_Parking_Zone_5 == 'PT1':
        Park_Bay_Res_WO_Conc_5 = 1
        Park_Bay_Office_WO_Conc_5 = 0
        Park_Bay_Retail_WO_Conc_5 = 0
    elif Parcel_Parking_Zone_5 == 'PT2':
        Park_Bay_Res_WO_Conc_5 = 0
        Park_Bay_Office_WO_Conc_5 = 0

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    Park_Bay_Retail_WO_Conc_5 = 0
else:
    print 'ErrorSR1-2'
elif 'SR2' in Parcel_Zone_5:
    if Parcel_Parking_Zone_5 == 0:
        if Parcel_Size_5 < 100:
            Park_Bay_Res_WO_Conc_5 = 0
            Park_Bay_Office_WO_Conc_5 = 0
            Park_Bay_Retail_WO_Conc_5 = 0
        elif Parcel_Size_5 >= 100:
            Park_Bay_Res_WO_Conc_5 = 1
            Park_Bay_Office_WO_Conc_5 = 0
            Park_Bay_Retail_WO_Conc_5 = 0
        else:
            print 'ErrorSR2-1'
    elif Parcel_Parking_Zone_5 == 'PT1':
        Park_Bay_Res_WO_Conc_5 = 0
        Park_Bay_Office_WO_Conc_5 = 0
        Park_Bay_Retail_WO_Conc_5 = 0
    elif Parcel_Parking_Zone_5 == 'PT2':
        Park_Bay_Res_WO_Conc_5 = 0
        Park_Bay_Office_WO_Conc_5 = 0
        Park_Bay_Retail_WO_Conc_5 = 0
    else:
        print 'Error SR2-2'
elif 'GR' in Parcel_Zone_5:
    if Parcel_Parking_Zone_5 == 0:
        Park_Bay_Res_WO_Conc_5 = 2
        Park_Bay_Office_WO_Conc_5 = 0
        Park_Bay_Retail_WO_Conc_5 = 0
    elif Parcel_Parking_Zone_5 == 'PT1':
        Park_Bay_Res_WO_Conc_5 = 1.25
        Park_Bay_Office_WO_Conc_5 = 0
        Park_Bay_Retail_WO_Conc_5 = 0
    elif Parcel_Parking_Zone_5 == 'PT2':
        Park_Bay_Res_WO_Conc_5 = 1
        Park_Bay_Office_WO_Conc_5 = 0
        Park_Bay_Retail_WO_Conc_5 = 0
    else:
        print 'Error GR-1'
elif 'LB1' in Parcel_Zone_5:
    if Parcel_Parking_Zone_5 == 0:
        Park_Bay_Res_WO_Conc_5 = 2
        Park_Bay_Office_WO_Conc_5 = 4
        Park_Bay_Retail_WO_Conc_5 = 0
    elif Parcel_Parking_Zone_5 == 'PT1':
        Park_Bay_Res_WO_Conc_5 = 1.25
        Park_Bay_Office_WO_Conc_5 = 2.5
        Park_Bay_Retail_WO_Conc_5 = 0
    elif Parcel_Parking_Zone_5 == 'PT2':
        Park_Bay_Res_WO_Conc_5 = 1
        Park_Bay_Office_WO_Conc_5 = 1
        Park_Bay_Retail_WO_Conc_5 = 0
    else:
        print 'Error LB1-1'
elif 'LB2' in Parcel_Zone_5:
    if Parcel_Parking_Zone_5 == 0:
        Park_Bay_Res_WO_Conc_5 = 2
        Park_Bay_Office_WO_Conc_5 = 0
        Park_Bay_Retail_WO_Conc_5 = 4
    elif Parcel_Parking_Zone_5 == 'PT1':
        Park_Bay_Res_WO_Conc_5 = 1.25
        Park_Bay_Office_WO_Conc_5 = 0
        Park_Bay_Retail_WO_Conc_5 = 2
    elif Parcel_Parking_Zone_5 == 'PT2':
        Park_Bay_Res_WO_Conc_5 = 1

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    Park_Bay_Office_WO_Conc_5 = 0
    Park_Bay_Retail_WO_Conc_5 = 1
else:
    print 'Error LB2-1'
elif 'GB' in Parcel_Zone_5:
    if Parcel_Parking_Zone_5 == 0:
        Park_Bay_Res_WO_Conc_5 = 2
        Park_Bay_Office_WO_Conc_5 = 4
        Park_Bay_Retail_WO_Conc_5 = 4
    elif Parcel_Parking_Zone_5 == 'PT1':
        Park_Bay_Res_WO_Conc_5 = 1.25
        Park_Bay_Office_WO_Conc_5 = 2.5
        Park_Bay_Retail_WO_Conc_5 = 2
    elif Parcel_Parking_Zone_5 == 'PT2':
        Park_Bay_Res_WO_Conc_5 = 1
        Park_Bay_Office_WO_Conc_5 = 1
        Park_Bay_Retail_WO_Conc_5 = 1
    else:
        print 'Error GB-1'
elif 'MU' in Parcel_Zone_5:
    if Parcel_Parking_Zone_5 == 0:
        Park_Bay_Res_WO_Conc_5 = 2
        Park_Bay_Office_WO_Conc_5 = 4
        Park_Bay_Retail_WO_Conc_5 = 4
    elif Parcel_Parking_Zone_5 == 'PT1':
        Park_Bay_Res_WO_Conc_5 = 1.25
        Park_Bay_Office_WO_Conc_5 = 2.5
        Park_Bay_Retail_WO_Conc_5 = 2
    elif Parcel_Parking_Zone_5 == 'PT2':
        Park_Bay_Res_WO_Conc_5 = 1
        Park_Bay_Office_WO_Conc_5 = 1
        Park_Bay_Retail_WO_Conc_5 = 1
    else:
        print 'Error MU-1'
elif 'GI' in Parcel_Zone_5:
    if Parcel_Parking_Zone_5 == 0:
        Park_Bay_Res_WO_Conc_5 = 0
        Park_Bay_Office_WO_Conc_5 = 4
        Park_Bay_Retail_WO_Conc_5 = 4
    elif Parcel_Parking_Zone_5 == 'PT1':
        Park_Bay_Res_WO_Conc_5 = 0
        Park_Bay_Office_WO_Conc_5 = 2.5
        Park_Bay_Retail_WO_Conc_5 = 2
    elif Parcel_Parking_Zone_5 == 'PT2':
        Park_Bay_Res_WO_Conc_5 = 0
        Park_Bay_Office_WO_Conc_5 = 1
        Park_Bay_Retail_WO_Conc_5 = 1
    else:
        print 'Error GI-1'

#Zone 1 With Concession Parking Calculations
if 'SR1' in Pref_LU_Zone_1:
    if Pref_Park_Zone_1 == 0:
        if Parcel_Size_1 < 350:
            Park_Bay_Res_W_Conc_1 = 1
            Park_Bay_Office_W_Conc_1 = 0
            Park_Bay_Retail_W_Conc_1 = 0
        elif Parcel_Size_1 >= 350:
            Park_Bay_Res_W_Conc_1 = 2
            Park_Bay_Office_W_Conc_1 = 0
            Park_Bay_Retail_W_Conc_1 = 0
        else:
            print 'ErrorConcSR1-1'
    elif Pref_Park_Zone_1 == 'PT1':
        Park_Bay_Res_W_Conc_1 = 1
        Park_Bay_Office_W_Conc_1 = 0

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    Park_Bay_Retail_W_Conc_1 = 0
elif Pref_Park_Zone_1 == 'PT2':
    Park_Bay_Res_W_Conc_1 = 0
    Park_Bay_Office_W_Conc_1 = 0
    Park_Bay_Retail_W_Conc_1 = 0
elif Pref_Park_Zone_1 == 'PT3':
    Park_Bay_Res_W_Conc_1 = 0
    Park_Bay_Office_W_Conc_1 = 0
    Park_Bay_Retail_W_Conc_1 = 0
elif Pref_Park_Zone_1 == 'PT4':
    Park_Bay_Res_W_Conc_1 = 0
    Park_Bay_Office_W_Conc_1 = 0
    Park_Bay_Retail_W_Conc_1 = 0
else:
    print 'ErrorConcSR1-2'
elif 'SR2' in Pref_LU_Zone_1:
    if Pref_Park_Zone_1 == 0:
        if Parcel_Size_1 < 100:
            Park_Bay_Res_W_Conc_1 = 0
            Park_Bay_Office_W_Conc_1 = 0
            Park_Bay_Retail_W_Conc_1 = 0
        elif Parcel_Size_1 >= 100:
            Park_Bay_Res_W_Conc_1 = 1
            Park_Bay_Office_W_Conc_1 = 0
            Park_Bay_Retail_W_Conc_1 = 0
        else:
            print 'ErrorConcSR2-1'
    elif Pref_Park_Zone_1 == 'PT1':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT2':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT3':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT4':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    else:
        print 'ErrorConc SR2-2'
elif 'GR' in Pref_LU_Zone_1:
    if Pref_Park_Zone_1 == 0:
        Park_Bay_Res_W_Conc_1 = 2
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT1':
        Park_Bay_Res_W_Conc_1 = 1.25
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT2':
        Park_Bay_Res_W_Conc_1 = 1
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT3':
        Park_Bay_Res_W_Conc_1 = 0.75
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT4':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0

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else:
    print 'ErrorConc GR-1'
elif 'LB1' in Pref_LU_Zone_1:
    if Pref_Park_Zone_1 == 0:
        Park_Bay_Res_W_Conc_1 = 2
        Park_Bay_Office_W_Conc_1 = 4
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT1':
        Park_Bay_Res_W_Conc_1 = 1.25
        Park_Bay_Office_W_Conc_1 = 2.5
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT2':
        Park_Bay_Res_W_Conc_1 = 1
        Park_Bay_Office_W_Conc_1 = 1
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT3':
        Park_Bay_Res_W_Conc_1 = 0.75
        Park_Bay_Office_W_Conc_1 = 0.75
        Park_Bay_Retail_W_Conc_1 = 0
    elif Pref_Park_Zone_1 == 'PT4':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    else:
        print 'ErrorConc LB1-1'
elif 'LB2' in Pref_LU_Zone_1:
    if Pref_Park_Zone_1 == 0:
        Park_Bay_Res_W_Conc_1 = 2
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 4
    elif Pref_Park_Zone_1 == 'PT1':
        Park_Bay_Res_W_Conc_1 = 1.25
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 2
    elif Pref_Park_Zone_1 == 'PT2':
        Park_Bay_Res_W_Conc_1 = 1
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 1
    elif Pref_Park_Zone_1 == 'PT3':
        Park_Bay_Res_W_Conc_1 = 0.75
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0.75
    elif Pref_Park_Zone_1 == 'PT4':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    else:
        print 'ErrorConc LB2-1'
elif 'GB' in Pref_LU_Zone_1:
    if Pref_Park_Zone_1 == 0:
        Park_Bay_Res_W_Conc_1 = 2
        Park_Bay_Office_W_Conc_1 = 4
        Park_Bay_Retail_W_Conc_1 = 4
    elif Pref_Park_Zone_1 == 'PT1':
        Park_Bay_Res_W_Conc_1 = 1.25
        Park_Bay_Office_W_Conc_1 = 2.5
        Park_Bay_Retail_W_Conc_1 = 2
    elif Pref_Park_Zone_1 == 'PT2':
        Park_Bay_Res_W_Conc_1 = 1
        Park_Bay_Office_W_Conc_1 = 1
        Park_Bay_Retail_W_Conc_1 = 1
    elif Pref_Park_Zone_1 == 'PT3':
        Park_Bay_Res_W_Conc_1 = 0.75
        Park_Bay_Office_W_Conc_1 = 0.75
        Park_Bay_Retail_W_Conc_1 = 0.75
    elif Pref_Park_Zone_1 == 'PT4':

```



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    Park_Bay_Res_W_Conc_1 = 0
    Park_Bay_Office_W_Conc_1 = 0
    Park_Bay_Retail_W_Conc_1 = 0
else:
    print 'ErrorConc GB-1'
elif 'MU' in Pref_LU_Zone_1:
    if Pref_Park_Zone_1 == 0:
        Park_Bay_Res_W_Conc_1 = 2
        Park_Bay_Office_W_Conc_1 = 4
        Park_Bay_Retail_W_Conc_1 = 4
    elif Pref_Park_Zone_1 == 'PT1':
        Park_Bay_Res_W_Conc_1 = 1.25
        Park_Bay_Office_W_Conc_1 = 2.5
        Park_Bay_Retail_W_Conc_1 = 2
    elif Pref_Park_Zone_1 == 'PT2':
        Park_Bay_Res_W_Conc_1 = 1
        Park_Bay_Office_W_Conc_1 = 1
        Park_Bay_Retail_W_Conc_1 = 1
    elif Pref_Park_Zone_1 == 'PT3':
        Park_Bay_Res_W_Conc_1 = 0.75
        Park_Bay_Office_W_Conc_1 = 0.75
        Park_Bay_Retail_W_Conc_1 = 0.75
    elif Pref_Park_Zone_1 == 'PT4':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    else:
        print 'ErrorConc MU-1'
elif 'GI' in Pref_LU_Zone_1:
    if Pref_Park_Zone_1 == 0:
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 4
        Park_Bay_Retail_W_Conc_1 = 4
    elif Pref_Park_Zone_1 == 'PT1':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 2.5
        Park_Bay_Retail_W_Conc_1 = 2
    elif Pref_Park_Zone_1 == 'PT2':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 1
        Park_Bay_Retail_W_Conc_1 = 1
    elif Pref_Park_Zone_1 == 'PT3':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0.75
        Park_Bay_Retail_W_Conc_1 = 0.75
    elif Pref_Park_Zone_1 == 'PT4':
        Park_Bay_Res_W_Conc_1 = 0
        Park_Bay_Office_W_Conc_1 = 0
        Park_Bay_Retail_W_Conc_1 = 0
    else:
        print 'ErrorConc GI-1'

```

#Zone 2 With Concession Parking Calculations

```

if 'SR1' in Pref_LU_Zone_2:
    if Pref_Park_Zone_2 == 0:
        if Parcel_Size_2 < 350:
            Park_Bay_Res_W_Conc_2 = 1
            Park_Bay_Office_W_Conc_2 = 0
            Park_Bay_Retail_W_Conc_2 = 0
        elif Parcel_Size_2 >= 350:
            Park_Bay_Res_W_Conc_2 = 2
            Park_Bay_Office_W_Conc_2 = 0
            Park_Bay_Retail_W_Conc_2 = 0
        else:
            print 'ErrorConcSR1-1'
    elif Pref_Park_Zone_2 == 'PT1':

```

```

    Park_Bay_Res_W_Conc_2 = 1
    Park_Bay_Office_W_Conc_2 = 0
    Park_Bay_Retail_W_Conc_2 = 0
elif Pref_Park_Zone_2 == 'PT2':
    Park_Bay_Res_W_Conc_2 = 0
    Park_Bay_Office_W_Conc_2 = 0
    Park_Bay_Retail_W_Conc_2 = 0
elif Pref_Park_Zone_2 == 'PT3':
    Park_Bay_Res_W_Conc_2 = 0
    Park_Bay_Office_W_Conc_2 = 0
    Park_Bay_Retail_W_Conc_2 = 0
elif Pref_Park_Zone_2 == 'PT4':
    Park_Bay_Res_W_Conc_2 = 0
    Park_Bay_Office_W_Conc_2 = 0
    Park_Bay_Retail_W_Conc_2 = 0
else:
    print 'ErrorConcSR1-2'
elif 'SR2' in Pref_LU_Zone_2:
    if Pref_Park_Zone_2 == 0:
        if Parcel_Size_2 < 100:
            Park_Bay_Res_W_Conc_2 = 0
            Park_Bay_Office_W_Conc_2 = 0
            Park_Bay_Retail_W_Conc_2 = 0
        elif Parcel_Size_2 >= 100:
            Park_Bay_Res_W_Conc_2 = 1
            Park_Bay_Office_W_Conc_2 = 0
            Park_Bay_Retail_W_Conc_2 = 0
        else:
            print 'ErrorConcSR2-1'
    elif Pref_Park_Zone_2 == 'PT1':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT2':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT3':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT4':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    else:
        print 'ErrorConc SR2-2'
elif 'GR' in Pref_LU_Zone_2:
    if Pref_Park_Zone_2 == 0:
        Park_Bay_Res_W_Conc_2 = 2
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT1':
        Park_Bay_Res_W_Conc_2 = 1.25
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT2':
        Park_Bay_Res_W_Conc_2 = 1
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT3':
        Park_Bay_Res_W_Conc_2 = 0.75
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT4':
        Park_Bay_Res_W_Conc_2 = 0

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    Park_Bay_Office_W_Conc_2 = 0
    Park_Bay_Retail_W_Conc_2 = 0
else:
    print 'ErrorConc GR-1'
elif 'LB1' in Pref_LU_Zone_2:
    if Pref_Park_Zone_2 == 0:
        Park_Bay_Res_W_Conc_2 = 2
        Park_Bay_Office_W_Conc_2 = 4
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT1':
        Park_Bay_Res_W_Conc_2 = 1.25
        Park_Bay_Office_W_Conc_2 = 2.5
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT2':
        Park_Bay_Res_W_Conc_2 = 1
        Park_Bay_Office_W_Conc_2 = 1
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT3':
        Park_Bay_Res_W_Conc_2 = 0.75
        Park_Bay_Office_W_Conc_2 = 0.75
        Park_Bay_Retail_W_Conc_2 = 0
    elif Pref_Park_Zone_2 == 'PT4':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    else:
        print 'ErrorConc LB1-1'
elif 'LB2' in Pref_LU_Zone_2:
    if Pref_Park_Zone_2 == 0:
        Park_Bay_Res_W_Conc_2 = 2
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 4
    elif Pref_Park_Zone_2 == 'PT1':
        Park_Bay_Res_W_Conc_2 = 1.25
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 2
    elif Pref_Park_Zone_2 == 'PT2':
        Park_Bay_Res_W_Conc_2 = 1
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 1
    elif Pref_Park_Zone_2 == 'PT3':
        Park_Bay_Res_W_Conc_2 = 0.75
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0.75
    elif Pref_Park_Zone_2 == 'PT4':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    else:
        print 'ErrorConc LB2-1'
elif 'GB' in Pref_LU_Zone_2:
    if Pref_Park_Zone_2 == 0:
        Park_Bay_Res_W_Conc_2 = 2
        Park_Bay_Office_W_Conc_2 = 4
        Park_Bay_Retail_W_Conc_2 = 4
    elif Pref_Park_Zone_2 == 'PT1':
        Park_Bay_Res_W_Conc_2 = 1.25
        Park_Bay_Office_W_Conc_2 = 2.5
        Park_Bay_Retail_W_Conc_2 = 2
    elif Pref_Park_Zone_2 == 'PT2':
        Park_Bay_Res_W_Conc_2 = 1
        Park_Bay_Office_W_Conc_2 = 1
        Park_Bay_Retail_W_Conc_2 = 1
    elif Pref_Park_Zone_2 == 'PT3':
        Park_Bay_Res_W_Conc_2 = 0.75
        Park_Bay_Office_W_Conc_2 = 0.75

```

```

    Park_Bay_Retail_W_Conc_2 = 0.75
elif Pref_Park_Zone_2 == 'PT4':
    Park_Bay_Res_W_Conc_2 = 0
    Park_Bay_Office_W_Conc_2 = 0
    Park_Bay_Retail_W_Conc_2 = 0
else:
    print 'ErrorConc GB-1'
elif 'MU' in Pref_LU_Zone_2:
    if Pref_Park_Zone_2 == 0:
        Park_Bay_Res_W_Conc_2 = 2
        Park_Bay_Office_W_Conc_2 = 4
        Park_Bay_Retail_W_Conc_2 = 4
    elif Pref_Park_Zone_2 == 'PT1':
        Park_Bay_Res_W_Conc_2 = 1.25
        Park_Bay_Office_W_Conc_2 = 2.5
        Park_Bay_Retail_W_Conc_2 = 2
    elif Pref_Park_Zone_2 == 'PT2':
        Park_Bay_Res_W_Conc_2 = 1
        Park_Bay_Office_W_Conc_2 = 1
        Park_Bay_Retail_W_Conc_2 = 1
    elif Pref_Park_Zone_2 == 'PT3':
        Park_Bay_Res_W_Conc_2 = 0.75
        Park_Bay_Office_W_Conc_2 = 0.75
        Park_Bay_Retail_W_Conc_2 = 0.75
    elif Pref_Park_Zone_2 == 'PT4':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    else:
        print 'ErrorConc MU-1'
elif 'GI' in Pref_LU_Zone_2:
    if Pref_Park_Zone_2 == 0:
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 4
        Park_Bay_Retail_W_Conc_2 = 4
    elif Pref_Park_Zone_2 == 'PT1':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 2.5
        Park_Bay_Retail_W_Conc_2 = 2
    elif Pref_Park_Zone_2 == 'PT2':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 1
        Park_Bay_Retail_W_Conc_2 = 1
    elif Pref_Park_Zone_2 == 'PT3':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0.75
        Park_Bay_Retail_W_Conc_2 = 0.75
    elif Pref_Park_Zone_2 == 'PT4':
        Park_Bay_Res_W_Conc_2 = 0
        Park_Bay_Office_W_Conc_2 = 0
        Park_Bay_Retail_W_Conc_2 = 0
    else:
        print 'ErrorConc GI-1'

#Zone 3 With Concession Parking Calculations
if 'SR1' in Pref_LU_Zone_3:
    if Pref_Park_Zone_3 == 0:
        if Parcel_Size_3 < 350:
            Park_Bay_Res_W_Conc_3 = 1
            Park_Bay_Office_W_Conc_3 = 0
            Park_Bay_Retail_W_Conc_3 = 0
        elif Parcel_Size_3 >= 350:
            Park_Bay_Res_W_Conc_3 = 2
            Park_Bay_Office_W_Conc_3 = 0
            Park_Bay_Retail_W_Conc_3 = 0
    else:

```

```

        print 'ErrorConcSR1-1'
    elif Pref_Park_Zone_3 == 'PT1':
        Park_Bay_Res_W_Conc_3 = 1
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT2':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT3':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT4':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    else:
        print 'ErrorConcSR1-2'
elif 'SR2' in Pref_LU_Zone_3:
    if Pref_Park_Zone_3 == 0:
        if Parcel_Size_3 < 100:
            Park_Bay_Res_W_Conc_3 = 0
            Park_Bay_Office_W_Conc_3 = 0
            Park_Bay_Retail_W_Conc_3 = 0
        elif Parcel_Size_3 >= 100:
            Park_Bay_Res_W_Conc_3 = 1
            Park_Bay_Office_W_Conc_3 = 0
            Park_Bay_Retail_W_Conc_3 = 0
        else:
            print 'ErrorConcSR2-1'
    elif Pref_Park_Zone_3 == 'PT1':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT2':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT3':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT4':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    else:
        print 'ErrorConc SR2-2'
elif 'GR' in Pref_LU_Zone_3:
    if Pref_Park_Zone_3 == 0:
        Park_Bay_Res_W_Conc_3 = 2
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT1':
        Park_Bay_Res_W_Conc_3 = 1.25
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT2':
        Park_Bay_Res_W_Conc_3 = 1
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT3':
        Park_Bay_Res_W_Conc_3 = 0.75
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0

```

```

elif Pref_Park_Zone_3 == 'PT4':
    Park_Bay_Res_W_Conc_3 = 0
    Park_Bay_Office_W_Conc_3 = 0
    Park_Bay_Retail_W_Conc_3 = 0
else:
    print 'ErrorConc GR-1'
elif 'LB1' in Pref_LU_Zone_3:
    if Pref_Park_Zone_3 == 0:
        Park_Bay_Res_W_Conc_3 = 2
        Park_Bay_Office_W_Conc_3 = 4
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT1':
        Park_Bay_Res_W_Conc_3 = 1.25
        Park_Bay_Office_W_Conc_3 = 2.5
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT2':
        Park_Bay_Res_W_Conc_3 = 1
        Park_Bay_Office_W_Conc_3 = 1
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT3':
        Park_Bay_Res_W_Conc_3 = 0.75
        Park_Bay_Office_W_Conc_3 = 0.75
        Park_Bay_Retail_W_Conc_3 = 0
    elif Pref_Park_Zone_3 == 'PT4':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    else:
        print 'ErrorConc LB1-1'
elif 'LB2' in Pref_LU_Zone_3:
    if Pref_Park_Zone_3 == 0:
        Park_Bay_Res_W_Conc_3 = 2
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 4
    elif Pref_Park_Zone_3 == 'PT1':
        Park_Bay_Res_W_Conc_3 = 1.25
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 2
    elif Pref_Park_Zone_3 == 'PT2':
        Park_Bay_Res_W_Conc_3 = 1
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 1
    elif Pref_Park_Zone_3 == 'PT3':
        Park_Bay_Res_W_Conc_3 = 0.75
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0.75
    elif Pref_Park_Zone_3 == 'PT4':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    else:
        print 'ErrorConc LB2-1'
elif 'GB' in Pref_LU_Zone_3:
    if Pref_Park_Zone_3 == 0:
        Park_Bay_Res_W_Conc_3 = 2
        Park_Bay_Office_W_Conc_3 = 4
        Park_Bay_Retail_W_Conc_3 = 4
    elif Pref_Park_Zone_3 == 'PT1':
        Park_Bay_Res_W_Conc_3 = 1.25
        Park_Bay_Office_W_Conc_3 = 2.5
        Park_Bay_Retail_W_Conc_3 = 2
    elif Pref_Park_Zone_3 == 'PT2':
        Park_Bay_Res_W_Conc_3 = 1
        Park_Bay_Office_W_Conc_3 = 1
        Park_Bay_Retail_W_Conc_3 = 1
    elif Pref_Park_Zone_3 == 'PT3':

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    Park_Bay_Res_W_Conc_3 = 0.75
    Park_Bay_Office_W_Conc_3 = 0.75
    Park_Bay_Retail_W_Conc_3 = 0.75
elif Pref_Park_Zone_3 == 'PT4':
    Park_Bay_Res_W_Conc_3 = 0
    Park_Bay_Office_W_Conc_3 = 0
    Park_Bay_Retail_W_Conc_3 = 0
else:
    print 'ErrorConc GB-1'
elif 'MU' in Pref_LU_Zone_3:
    if Pref_Park_Zone_3 == 0:
        Park_Bay_Res_W_Conc_3 = 2
        Park_Bay_Office_W_Conc_3 = 4
        Park_Bay_Retail_W_Conc_3 = 4
    elif Pref_Park_Zone_3 == 'PT1':
        Park_Bay_Res_W_Conc_3 = 1.25
        Park_Bay_Office_W_Conc_3 = 2.5
        Park_Bay_Retail_W_Conc_3 = 2
    elif Pref_Park_Zone_3 == 'PT2':
        Park_Bay_Res_W_Conc_3 = 1
        Park_Bay_Office_W_Conc_3 = 1
        Park_Bay_Retail_W_Conc_3 = 1
    elif Pref_Park_Zone_3 == 'PT3':
        Park_Bay_Res_W_Conc_3 = 0.75
        Park_Bay_Office_W_Conc_3 = 0.75
        Park_Bay_Retail_W_Conc_3 = 0.75
    elif Pref_Park_Zone_3 == 'PT4':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    else:
        print 'ErrorConc MU-1'
elif 'GI' in Pref_LU_Zone_3:
    if Pref_Park_Zone_3 == 0:
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 4
        Park_Bay_Retail_W_Conc_3 = 4
    elif Pref_Park_Zone_3 == 'PT1':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 2.5
        Park_Bay_Retail_W_Conc_3 = 2
    elif Pref_Park_Zone_3 == 'PT2':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 1
        Park_Bay_Retail_W_Conc_3 = 1
    elif Pref_Park_Zone_3 == 'PT3':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0.75
        Park_Bay_Retail_W_Conc_3 = 0.75
    elif Pref_Park_Zone_3 == 'PT4':
        Park_Bay_Res_W_Conc_3 = 0
        Park_Bay_Office_W_Conc_3 = 0
        Park_Bay_Retail_W_Conc_3 = 0
    else:
        print 'ErrorConc GI-1'

#Zone 4 With Concession Parking Calculations
if 'SR1' in Pref_LU_Zone_4:
    if Pref_Park_Zone_4 == 0:
        if Parcel_Size_4 < 350:
            Park_Bay_Res_W_Conc_4 = 1
            Park_Bay_Office_W_Conc_4 = 0
            Park_Bay_Retail_W_Conc_4 = 0
        elif Parcel_Size_4 >= 350:
            Park_Bay_Res_W_Conc_4 = 2
            Park_Bay_Office_W_Conc_4 = 0

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```

        Park_Bay_Retail_W_Conc_4 = 0
    else:
        print 'ErrorConcSR1-1'
    elif Pref_Park_Zone_4 == 'PT1':
        Park_Bay_Res_W_Conc_4 = 1
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT2':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT3':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT4':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    else:
        print 'ErrorConcSR1-2'
elif 'SR2' in Pref_LU_Zone_4:
    if Pref_Park_Zone_4 == 0:
        if Parcel_Size_4 < 100:
            Park_Bay_Res_W_Conc_4 = 0
            Park_Bay_Office_W_Conc_4 = 0
            Park_Bay_Retail_W_Conc_4 = 0
        elif Parcel_Size_4 >= 100:
            Park_Bay_Res_W_Conc_4 = 1
            Park_Bay_Office_W_Conc_4 = 0
            Park_Bay_Retail_W_Conc_4 = 0
        else:
            print 'ErrorConcSR2-1'
    elif Pref_Park_Zone_4 == 'PT1':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT2':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT3':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT4':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    else:
        print 'ErrorConc SR2-2'
elif 'GR' in Pref_LU_Zone_4:
    if Pref_Park_Zone_4 == 0:
        Park_Bay_Res_W_Conc_4 = 2
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT1':
        Park_Bay_Res_W_Conc_4 = 1.25
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT2':
        Park_Bay_Res_W_Conc_4 = 1
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT3':
        Park_Bay_Res_W_Conc_4 = 0.75

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    Park_Bay_Office_W_Conc_4 = 0
    Park_Bay_Retail_W_Conc_4 = 0
elif Pref_Park_Zone_4 == 'PT4':
    Park_Bay_Res_W_Conc_4 = 0
    Park_Bay_Office_W_Conc_4 = 0
    Park_Bay_Retail_W_Conc_4 = 0
else:
    print 'ErrorConc GR-1'
elif 'LB1' in Pref_LU_Zone_4:
    if Pref_Park_Zone_4 == 0:
        Park_Bay_Res_W_Conc_4 = 2
        Park_Bay_Office_W_Conc_4 = 4
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT1':
        Park_Bay_Res_W_Conc_4 = 1.25
        Park_Bay_Office_W_Conc_4 = 2.5
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT2':
        Park_Bay_Res_W_Conc_4 = 1
        Park_Bay_Office_W_Conc_4 = 1
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT3':
        Park_Bay_Res_W_Conc_4 = 0.75
        Park_Bay_Office_W_Conc_4 = 0.75
        Park_Bay_Retail_W_Conc_4 = 0
    elif Pref_Park_Zone_4 == 'PT4':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    else:
        print 'ErrorConc LB1-1'
elif 'LB2' in Pref_LU_Zone_4:
    if Pref_Park_Zone_4 == 0:
        Park_Bay_Res_W_Conc_4 = 2
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 4
    elif Pref_Park_Zone_4 == 'PT1':
        Park_Bay_Res_W_Conc_4 = 1.25
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 2
    elif Pref_Park_Zone_4 == 'PT2':
        Park_Bay_Res_W_Conc_4 = 1
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 1
    elif Pref_Park_Zone_4 == 'PT3':
        Park_Bay_Res_W_Conc_4 = 0.75
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0.75
    elif Pref_Park_Zone_4 == 'PT4':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    else:
        print 'ErrorConc LB2-1'
elif 'GB' in Pref_LU_Zone_4:
    if Pref_Park_Zone_4 == 0:
        Park_Bay_Res_W_Conc_4 = 2
        Park_Bay_Office_W_Conc_4 = 4
        Park_Bay_Retail_W_Conc_4 = 4
    elif Pref_Park_Zone_4 == 'PT1':
        Park_Bay_Res_W_Conc_4 = 1.25
        Park_Bay_Office_W_Conc_4 = 2.5
        Park_Bay_Retail_W_Conc_4 = 2
    elif Pref_Park_Zone_4 == 'PT2':
        Park_Bay_Res_W_Conc_4 = 1
        Park_Bay_Office_W_Conc_4 = 1

```

```

    Park_Bay_Retail_W_Conc_4 = 1
elif Pref_Park_Zone_4 == 'PT3':
    Park_Bay_Res_W_Conc_4 = 0.75
    Park_Bay_Office_W_Conc_4 = 0.75
    Park_Bay_Retail_W_Conc_4 = 0.75
elif Pref_Park_Zone_4 == 'PT4':
    Park_Bay_Res_W_Conc_4 = 0
    Park_Bay_Office_W_Conc_4 = 0
    Park_Bay_Retail_W_Conc_4 = 0
else:
    print 'ErrorConc GB-1'
elif 'MU' in Pref_LU_Zone_4:
    if Pref_Park_Zone_4 == 0:
        Park_Bay_Res_W_Conc_4 = 2
        Park_Bay_Office_W_Conc_4 = 4
        Park_Bay_Retail_W_Conc_4 = 4
    elif Pref_Park_Zone_4 == 'PT1':
        Park_Bay_Res_W_Conc_4 = 1.25
        Park_Bay_Office_W_Conc_4 = 2.5
        Park_Bay_Retail_W_Conc_4 = 2
    elif Pref_Park_Zone_4 == 'PT2':
        Park_Bay_Res_W_Conc_4 = 1
        Park_Bay_Office_W_Conc_4 = 1
        Park_Bay_Retail_W_Conc_4 = 1
    elif Pref_Park_Zone_4 == 'PT3':
        Park_Bay_Res_W_Conc_4 = 0.75
        Park_Bay_Office_W_Conc_4 = 0.75
        Park_Bay_Retail_W_Conc_4 = 0.75
    elif Pref_Park_Zone_4 == 'PT4':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    else:
        print 'ErrorConc MU-1'
elif 'GI' in Pref_LU_Zone_4:
    if Pref_Park_Zone_4 == 0:
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 4
        Park_Bay_Retail_W_Conc_4 = 4
    elif Pref_Park_Zone_4 == 'PT1':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 2.5
        Park_Bay_Retail_W_Conc_4 = 2
    elif Pref_Park_Zone_4 == 'PT2':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 1
        Park_Bay_Retail_W_Conc_4 = 1
    elif Pref_Park_Zone_4 == 'PT3':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0.75
        Park_Bay_Retail_W_Conc_4 = 0.75
    elif Pref_Park_Zone_4 == 'PT4':
        Park_Bay_Res_W_Conc_4 = 0
        Park_Bay_Office_W_Conc_4 = 0
        Park_Bay_Retail_W_Conc_4 = 0
    else:
        print 'ErrorConc GI-1'

#Zone 5 With Concession Parking Calculations
if 'SR1' in Pref_LU_Zone_5:
    if Pref_Park_Zone_5 == 0:
        if Parcel_Size_5 < 350:
            Park_Bay_Res_W_Conc_5 = 1
            Park_Bay_Office_W_Conc_5 = 0
            Park_Bay_Retail_W_Conc_5 = 0
        elif Parcel_Size_5 >= 350:

```

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        Park_Bay_Res_W_Conc_5 = 2
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    else:
        print 'ErrorConcSR1-1'
    elif Pref_Park_Zone_5 == 'PT1':
        Park_Bay_Res_W_Conc_5 = 1
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT2':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT3':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT4':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    else:
        print 'ErrorConcSR1-2'
elif 'SR2' in Pref_LU_Zone_5:
    if Pref_Park_Zone_5 == 0:
        if Parcel_Size_5 < 100:
            Park_Bay_Res_W_Conc_5 = 0
            Park_Bay_Office_W_Conc_5 = 0
            Park_Bay_Retail_W_Conc_5 = 0
        elif Parcel_Size_5 >= 100:
            Park_Bay_Res_W_Conc_5 = 1
            Park_Bay_Office_W_Conc_5 = 0
            Park_Bay_Retail_W_Conc_5 = 0
        else:
            print 'ErrorConcSR2-1'
    elif Pref_Park_Zone_5 == 'PT1':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT2':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT3':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT4':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    else:
        print 'ErrorConc SR2-2'
elif 'GR' in Pref_LU_Zone_5:
    if Pref_Park_Zone_5 == 0:
        Park_Bay_Res_W_Conc_5 = 2
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT1':
        Park_Bay_Res_W_Conc_5 = 1.25
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT2':
        Park_Bay_Res_W_Conc_5 = 1
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0

```

```

elif Pref_Park_Zone_5 == 'PT3':
    Park_Bay_Res_W_Conc_5 = 0.75
    Park_Bay_Office_W_Conc_5 = 0
    Park_Bay_Retail_W_Conc_5 = 0
elif Pref_Park_Zone_5 == 'PT4':
    Park_Bay_Res_W_Conc_5 = 0
    Park_Bay_Office_W_Conc_5 = 0
    Park_Bay_Retail_W_Conc_5 = 0
else:
    print 'ErrorConc GR-1'
elif 'LB1' in Pref_LU_Zone_5:
    if Pref_Park_Zone_5 == 0:
        Park_Bay_Res_W_Conc_5 = 2
        Park_Bay_Office_W_Conc_5 = 4
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT1':
        Park_Bay_Res_W_Conc_5 = 1.25
        Park_Bay_Office_W_Conc_5 = 2.5
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT2':
        Park_Bay_Res_W_Conc_5 = 1
        Park_Bay_Office_W_Conc_5 = 1
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT3':
        Park_Bay_Res_W_Conc_5 = 0.75
        Park_Bay_Office_W_Conc_5 = 0.75
        Park_Bay_Retail_W_Conc_5 = 0
    elif Pref_Park_Zone_5 == 'PT4':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    else:
        print 'ErrorConc LB1-1'
elif 'LB2' in Pref_LU_Zone_5:
    if Pref_Park_Zone_5 == 0:
        Park_Bay_Res_W_Conc_5 = 2
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 4
    elif Pref_Park_Zone_5 == 'PT1':
        Park_Bay_Res_W_Conc_5 = 1.25
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 2
    elif Pref_Park_Zone_5 == 'PT2':
        Park_Bay_Res_W_Conc_5 = 1
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 1
    elif Pref_Park_Zone_5 == 'PT3':
        Park_Bay_Res_W_Conc_5 = 0.75
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0.75
    elif Pref_Park_Zone_5 == 'PT4':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    else:
        print 'ErrorConc LB2-1'
elif 'GB' in Pref_LU_Zone_5:
    if Pref_Park_Zone_5 == 0:
        Park_Bay_Res_W_Conc_5 = 2
        Park_Bay_Office_W_Conc_5 = 4
        Park_Bay_Retail_W_Conc_5 = 4
    elif Pref_Park_Zone_5 == 'PT1':
        Park_Bay_Res_W_Conc_5 = 1.25
        Park_Bay_Office_W_Conc_5 = 2.5
        Park_Bay_Retail_W_Conc_5 = 2
    elif Pref_Park_Zone_5 == 'PT2':

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    Park_Bay_Res_W_Conc_5 = 1
    Park_Bay_Office_W_Conc_5 = 1
    Park_Bay_Retail_W_Conc_5 = 1
elif Pref_Park_Zone_5 == 'PT3':
    Park_Bay_Res_W_Conc_5 = 0.75
    Park_Bay_Office_W_Conc_5 = 0.75
    Park_Bay_Retail_W_Conc_5 = 0.75
elif Pref_Park_Zone_5 == 'PT4':
    Park_Bay_Res_W_Conc_5 = 0
    Park_Bay_Office_W_Conc_5 = 0
    Park_Bay_Retail_W_Conc_5 = 0
else:
    print 'ErrorConc GB-1'
elif 'MU' in Pref_LU_Zone_5:
    if Pref_Park_Zone_5 == 0:
        Park_Bay_Res_W_Conc_5 = 2
        Park_Bay_Office_W_Conc_5 = 4
        Park_Bay_Retail_W_Conc_5 = 4
    elif Pref_Park_Zone_5 == 'PT1':
        Park_Bay_Res_W_Conc_5 = 1.25
        Park_Bay_Office_W_Conc_5 = 2.5
        Park_Bay_Retail_W_Conc_5 = 2
    elif Pref_Park_Zone_5 == 'PT2':
        Park_Bay_Res_W_Conc_5 = 1
        Park_Bay_Office_W_Conc_5 = 1
        Park_Bay_Retail_W_Conc_5 = 1
    elif Pref_Park_Zone_5 == 'PT3':
        Park_Bay_Res_W_Conc_5 = 0.75
        Park_Bay_Office_W_Conc_5 = 0.75
        Park_Bay_Retail_W_Conc_5 = 0.75
    elif Pref_Park_Zone_5 == 'PT4':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    else:
        print 'ErrorConc MU-1'
elif 'GI' in Pref_LU_Zone_5:
    if Pref_Park_Zone_5 == 0:
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 4
        Park_Bay_Retail_W_Conc_5 = 4
    elif Pref_Park_Zone_5 == 'PT1':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 2.5
        Park_Bay_Retail_W_Conc_5 = 2
    elif Pref_Park_Zone_5 == 'PT2':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 1
        Park_Bay_Retail_W_Conc_5 = 1
    elif Pref_Park_Zone_5 == 'PT3':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0.75
        Park_Bay_Retail_W_Conc_5 = 0.75
    elif Pref_Park_Zone_5 == 'PT4':
        Park_Bay_Res_W_Conc_5 = 0
        Park_Bay_Office_W_Conc_5 = 0
        Park_Bay_Retail_W_Conc_5 = 0
    else:
        print 'ErrorConc GI-1'

print 'Parcel Size 1:', Parcel_Size_1
print 'Parcel Zone No Conc 1:', Parcel_Zone_1
print 'Parcel Zone W Conc 1:', Pref_LU_Zone_1
print 'Parking Zone 1 No Conc:', Parcel_Parking_Zone_1
print 'Parking Zone 1 W Conc:', Pref_Park_Zone_1
print 'Parking Bays Res No Conc 1:', Park_Bay_Res_WO_Conc_1

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print 'Parking Bays Res With Conc 1:', Park_Bay_Res_W_Conc_1
print 'Parking Bays Office No Conc 1:', Park_Bay_Office_WO_Conc_1
print 'Parking Bays Office With Conc 1:', Park_Bay_Office_W_Conc_1
print 'Parking Bays Retail No Conc 1:', Park_Bay_Retail_WO_Conc_1
print 'Parking Bays Retail With Conc 1:', Park_Bay_Retail_W_Conc_1
print "

```

```

print 'Parcel Size 2:', Parcel_Size_2
print 'Parcel Zone No Conc 2:', Parcel_Zone_2
print 'Parcel Zone W Conc 2:', Pref_LU_Zone_2
print 'Parking Zone 2 No Conc:', Parcel_Parking_Zone_2
print 'Parking Zone 2 W Conc:', Pref_Park_Zone_2
print 'Parking Bays Res No Conc 2:', Park_Bay_Res_WO_Conc_2
print 'Parking Bays Res With Conc 2:', Park_Bay_Res_W_Conc_2
print 'Parking Bays Office No Conc 2:', Park_Bay_Office_WO_Conc_2
print 'Parking Bays Office With Conc 2:', Park_Bay_Office_W_Conc_2
print 'Parking Bays Retail No Conc 2:', Park_Bay_Retail_WO_Conc_2
print 'Parking Bays Retail With Conc 2:', Park_Bay_Retail_W_Conc_2
print "

```

```

print 'Parcel Size 3:', Parcel_Size_3
print 'Parcel Zone No Conc 3:', Parcel_Zone_3
print 'Parcel Zone W Conc 3:', Pref_LU_Zone_3
print 'Parking Zone 3 No Conc:', Parcel_Parking_Zone_3
print 'Parking Zone 3 W Conc:', Pref_Park_Zone_3
print 'Parking Bays Res No Conc 3:', Park_Bay_Res_WO_Conc_3
print 'Parking Bays Res With Conc 3:', Park_Bay_Res_W_Conc_3
print 'Parking Bays Office No Conc 3:', Park_Bay_Office_WO_Conc_3
print 'Parking Bays Office With Conc 3:', Park_Bay_Office_W_Conc_3
print 'Parking Bays Retail No Conc 3:', Park_Bay_Retail_WO_Conc_3
print 'Parking Bays Retail With Conc 3:', Park_Bay_Retail_W_Conc_3
print "

```

```

print 'Parcel Size 4:', Parcel_Size_4
print 'Parcel Zone No Conc 4:', Parcel_Zone_4
print 'Parcel Zone W Conc 4:', Pref_LU_Zone_4
print 'Parking Zone 4 No Conc:', Parcel_Parking_Zone_4
print 'Parking Zone 4 W Conc:', Pref_Park_Zone_4
print 'Parking Bays Res No Conc 4:', Park_Bay_Res_WO_Conc_4
print 'Parking Bays Res With Conc 4:', Park_Bay_Res_W_Conc_4
print 'Parking Bays Office No Conc 4:', Park_Bay_Office_WO_Conc_4
print 'Parking Bays Office With Conc 4:', Park_Bay_Office_W_Conc_4
print 'Parking Bays Retail No Conc 4:', Park_Bay_Retail_WO_Conc_4
print 'Parking Bays Retail With Conc 4:', Park_Bay_Retail_W_Conc_4
print "

```

```

print 'Parcel Size 5:', Parcel_Size_5
print 'Parcel Zone No Conc 5:', Parcel_Zone_5
print 'Parcel Zone W Conc 5:', Pref_LU_Zone_5
print 'Parking Zone 5 No Conc:', Parcel_Parking_Zone_5
print 'Parking Zone 5 W Conc:', Pref_Park_Zone_5
print 'Parking Bays Res No Conc 5:', Park_Bay_Res_WO_Conc_5
print 'Parking Bays Res With Conc 5:', Park_Bay_Res_W_Conc_5
print 'Parking Bays Office No Conc 5:', Park_Bay_Office_WO_Conc_5
print 'Parking Bays Office With Conc 5:', Park_Bay_Office_W_Conc_5
print 'Parking Bays Retail No Conc 5:', Park_Bay_Retail_WO_Conc_5
print 'Parking Bays Retail With Conc 5:', Park_Bay_Retail_W_Conc_5

```

Module F – Floor Area Calculations

```
def main():
    pass

if __name__ == '__main__':
    main()

from Site_Configs_v2 import*
from Initial_Site_Calculations_v1 import*
from Calculations_Parking_v1 import*
import math

#Zone 1 No Concession Floor Area Calculations
if Parcel_Zone_1 in ['SR1']:
    if Parcel_Size_1 <= 650.0:
        Floor_Area_WO_Conc_1 = 1.0*Parcel_Size_1
    elif Parcel_Size_1 > 650.0:
        Floor_Area_WO_Conc_1 = 1500.0
elif Parcel_Zone_1 in ['GR1']:
    Floor_Area_WO_Conc_1 = Parcel_Size_1 - 14.0*(math.sqrt(Parcel_Size_1)) + 48.0
elif Parcel_Zone_1 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_WO_Conc_1 = 1.0*Parcel_Size_1
elif Parcel_Zone_1 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_WO_Conc_1 = 1.5*Parcel_Size_1
elif Parcel_Zone_1 in ['GB2','GB3']:
    Floor_Area_WO_Conc_1 = 2.0*Parcel_Size_1
elif Parcel_Zone_1 in ['GR5']:
    Floor_Area_WO_Conc_1 = 2.5*Parcel_Size_1
elif Parcel_Zone_1 in ['GB4']:
    Floor_Area_WO_Conc_1 = 3.0*Parcel_Size_1
elif Parcel_Zone_1 in ['GB5','MU2','GI2']:
    Floor_Area_WO_Conc_1 = 4.0*Parcel_Size_1
elif Parcel_Zone_1 in ['GR6']:
    Floor_Area_WO_Conc_1 = 5.0*Parcel_Size_1
elif Parcel_Zone_1 in ['GB6','MU3']:
    Floor_Area_WO_Conc_1 = 6.0*Parcel_Size_1
elif Parcel_Zone_1 in ['GB7']:
    Floor_Area_WO_Conc_1 = 12.0*Parcel_Size_1
elif Parcel_Zone_1 in ['GI1']:
    Floor_Area_WO_Conc_1 = 1.5*Parcel_Size_1
elif Parcel_Zone_1 in ['GI2']:
    Floor_Area_WO_Conc_1 = 4.0*Parcel_Size_1
elif Parcel_Zone_1 in ['None','LU','TR','OS','CO']:
    Floor_Area_WO_Conc_1 = 0.0*Parcel_Size_1
else:
    print 'ERROR: Floor Area Without Concessions 1'

#Zone 1 With Concession Floor Area Calculations
if Pref_LU_Zone_1 in ['SR1']:
    if Parcel_Size_1 <= 650.0:
        Floor_Area_W_Conc_1 = 1.0*Parcel_Size_1
    elif Parcel_Size_1 > 650.0:
        Floor_Area_W_Conc_1 = 1500.0
elif Pref_LU_Zone_1 in ['GR1']:
    Floor_Area_W_Conc_1 = Parcel_Size_1 - 14.0*(math.sqrt(Parcel_Size_1)) + 48.0
elif Pref_LU_Zone_1 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_W_Conc_1 = 1.0*Parcel_Size_1
elif Pref_LU_Zone_1 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_W_Conc_1 = 1.5*Parcel_Size_1
elif Pref_LU_Zone_1 in ['GB2','GB3']:
    Floor_Area_W_Conc_1 = 2.0*Parcel_Size_1
elif Pref_LU_Zone_1 in ['GR5']:
    Floor_Area_W_Conc_1 = 2.5*Parcel_Size_1
elif Pref_LU_Zone_1 in ['GB4']:
```

```

    Floor_Area_W_Conc_1 = 3.0*Parcel_Size_1
elif Pref_LU_Zone_1 in ['GB5','MU2','GI2']:
    Floor_Area_W_Conc_1 = 4.0*Parcel_Size_1
elif Pref_LU_Zone_1 in ['GR6']:
    Floor_Area_W_Conc_1 = 5.0*Parcel_Size_1
elif Pref_LU_Zone_1 in ['GB6','MU3']:
    Floor_Area_W_Conc_1 = 6.0*Parcel_Size_1
elif Pref_LU_Zone_1 in ['GB7']:
    Floor_Area_W_Conc_1 = 12.0*Parcel_Size_1
elif Parcel_Zone_1 in ['GI1']:
    Floor_Area_W_Conc_1 = 1.5*Parcel_Size_1
elif Parcel_Zone_1 in ['GI2']:
    Floor_Area_W_Conc_1 = 4.0*Parcel_Size_1
else:
    print 'ERROR: Floor Area Conc 1'

#Zone 2 No Concession Floor Area Calculations
if Parcel_Zone_2 in ['SR1']:
    if Parcel_Size_2 <= 650.0:
        Floor_Area_WO_Conc_2 = 1.0*Parcel_Size_2
    elif Parcel_Size_2 > 650.0:
        Floor_Area_WO_Conc_2 = 1500.0
elif Parcel_Zone_2 in ['GR1']:
    Floor_Area_WO_Conc_2 = Parcel_Size_2 - 14.0*(math.sqrt(Parcel_Size_2)) + 48.0
elif Parcel_Zone_2 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_WO_Conc_2 = 1.0*Parcel_Size_2
elif Parcel_Zone_2 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_WO_Conc_2 = 1.5*Parcel_Size_2
elif Parcel_Zone_2 in ['GB2','GB3']:
    Floor_Area_WO_Conc_2 = 2.0*Parcel_Size_2
elif Parcel_Zone_2 in ['GR5']:
    Floor_Area_WO_Conc_2 = 2.5*Parcel_Size_2
elif Parcel_Zone_2 in ['GB4']:
    Floor_Area_WO_Conc_2 = 3.0*Parcel_Size_2
elif Parcel_Zone_2 in ['GB5','MU2','GI2']:
    Floor_Area_WO_Conc_2 = 4.0*Parcel_Size_2
elif Parcel_Zone_2 in ['GR6']:
    Floor_Area_WO_Conc_2 = 5.0*Parcel_Size_2
elif Parcel_Zone_2 in ['GB6','MU3']:
    Floor_Area_WO_Conc_2 = 6.0*Parcel_Size_2
elif Parcel_Zone_2 in ['GB7']:
    Floor_Area_WO_Conc_2 = 12.0*Parcel_Size_2
elif Parcel_Zone_2 in ['GI1']:
    Floor_Area_WO_Conc_2 = 1.5*Parcel_Size_2
elif Parcel_Zone_2 in ['GI2']:
    Floor_Area_WO_Conc_2 = 4.0*Parcel_Size_2
elif Parcel_Zone_2 in ['None','LU','TR','OS','CO']:
    Floor_Area_WO_Conc_2 = 0.0*Parcel_Size_2
else:
    print 'ERROR: Floor Area Without Concessions 2'

#Zone 2 With Concession Floor Area Calculations
if Pref_LU_Zone_2 in ['SR1']:
    if Parcel_Size_2 <= 650.0:
        Floor_Area_W_Conc_2 = 1.0*Parcel_Size_2
    elif Parcel_Size_2 > 650.0:
        Floor_Area_W_Conc_2 = 1500.0
elif Pref_LU_Zone_2 in ['GR1']:
    Floor_Area_W_Conc_2 = Parcel_Size_2 - 14.0*(math.sqrt(Parcel_Size_2)) + 48.0
elif Pref_LU_Zone_2 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_W_Conc_2 = 1.0*Parcel_Size_2
elif Pref_LU_Zone_2 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_W_Conc_2 = 1.5*Parcel_Size_2
elif Pref_LU_Zone_2 in ['GB2','GB3']:
    Floor_Area_W_Conc_2 = 2.0*Parcel_Size_2
elif Pref_LU_Zone_2 in ['GR5']:

```



```

    Floor_Area_W_Conc_2 = 2.5*Parcel_Size_2
elif Pref_LU_Zone_2 in ['GB4']:
    Floor_Area_W_Conc_2 = 3.0*Parcel_Size_2
elif Pref_LU_Zone_2 in ['GB5','MU2','GI2']:
    Floor_Area_W_Conc_2 = 4.0*Parcel_Size_2
elif Pref_LU_Zone_2 in ['GR6']:
    Floor_Area_W_Conc_2 = 5.0*Parcel_Size_2
elif Pref_LU_Zone_2 in ['GB6','MU3']:
    Floor_Area_W_Conc_2 = 6.0*Parcel_Size_2
elif Pref_LU_Zone_2 in ['GB7']:
    Floor_Area_W_Conc_2 = 12.0*Parcel_Size_2
elif Parcel_Zone_2 in ['GI1']:
    Floor_Area_W_Conc_2 = 1.5*Parcel_Size_2
elif Parcel_Zone_2 in ['GI2']:
    Floor_Area_W_Conc_2 = 4.0*Parcel_Size_2

else:
    print 'ERROR: Floor Area Conc 2'

#Zone 3 No Concession Floor Area Calculations
if Parcel_Zone_3 in ['SR1']:
    if Parcel_Size_3 <= 650.0:
        Floor_Area_WO_Conc_3 = 1.0*Parcel_Size_3
    elif Parcel_Size_3 > 650.0:
        Floor_Area_WO_Conc_3 = 1500.0
elif Parcel_Zone_3 in ['GR1']:
    Floor_Area_WO_Conc_3 = Parcel_Size_3 - 14.0*(math.sqrt(Parcel_Size_3)) + 48.0
elif Parcel_Zone_3 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_WO_Conc_3 = 1.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_WO_Conc_3 = 1.5*Parcel_Size_3
elif Parcel_Zone_3 in ['GB2','GB3']:
    Floor_Area_WO_Conc_3 = 2.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GR5']:
    Floor_Area_WO_Conc_3 = 2.5*Parcel_Size_3
elif Parcel_Zone_3 in ['GB4']:
    Floor_Area_WO_Conc_3 = 3.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GB5','MU2','GI2']:
    Floor_Area_WO_Conc_3 = 4.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GR6']:
    Floor_Area_WO_Conc_3 = 5.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GB6','MU3']:
    Floor_Area_WO_Conc_3 = 6.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GB7']:
    Floor_Area_WO_Conc_3 = 12.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GB7']:
    Floor_Area_WO_Conc_3 = 12.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GI1']:
    Floor_Area_WO_Conc_3 = 1.5*Parcel_Size_3
elif Parcel_Zone_3 in ['GI2']:
    Floor_Area_WO_Conc_3 = 4.0*Parcel_Size_3
elif Parcel_Zone_3 in ['None','LU','TR','OS','CO']:
    Floor_Area_WO_Conc_3 = 0.0*Parcel_Size_3
else:
    print 'ERROR: Floor Area Without Concessions 3'

#Zone 3 With Concession Floor Area Calculations
if Pref_LU_Zone_3 in ['SR1']:
    if Parcel_Size_3 <= 650.0:
        Floor_Area_W_Conc_3 = 1.0*Parcel_Size_3
    elif Parcel_Size_3 > 650.0:
        Floor_Area_W_Conc_3 = 1500.0
elif Pref_LU_Zone_3 in ['GR1']:
    Floor_Area_W_Conc_3 = Parcel_Size_3 - 14.0*(math.sqrt(Parcel_Size_3)) + 48.0
elif Pref_LU_Zone_3 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_W_Conc_3 = 1.0*Parcel_Size_3

```

```

elif Pref_LU_Zone_3 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_W_Conc_3 = 1.5*Parcel_Size_3
elif Pref_LU_Zone_3 in ['GB2','GB3']:
    Floor_Area_W_Conc_3 = 2.0*Parcel_Size_3
elif Pref_LU_Zone_3 in ['GR5']:
    Floor_Area_W_Conc_3 = 2.5*Parcel_Size_3
elif Pref_LU_Zone_3 in ['GB4']:
    Floor_Area_W_Conc_3 = 3.0*Parcel_Size_3
elif Pref_LU_Zone_3 in ['GB5','MU2','GI2']:
    Floor_Area_W_Conc_3 = 4.0*Parcel_Size_3
elif Pref_LU_Zone_3 in ['GR6']:
    Floor_Area_W_Conc_3 = 5.0*Parcel_Size_3
elif Pref_LU_Zone_3 in ['GB6','MU3']:
    Floor_Area_W_Conc_3 = 6.0*Parcel_Size_3
elif Pref_LU_Zone_3 in ['GB7']:
    Floor_Area_W_Conc_3 = 12.0*Parcel_Size_3
elif Parcel_Zone_3 in ['GI1']:
    Floor_Area_W_Conc_3 = 1.5*Parcel_Size_3
elif Parcel_Zone_3 in ['GI2']:
    Floor_Area_W_Conc_3 = 4.0*Parcel_Size_3
else:
    print 'ERROR: Floor Area Conc 3'

#Zone 4 No Concession Floor Area Calculations
if Parcel_Zone_4 in ['SR1']:
    if Parcel_Size_4 <= 650.0:
        Floor_Area_WO_Conc_4 = 1.0*Parcel_Size_4
    elif Parcel_Size_4 > 650.0:
        Floor_Area_WO_Conc_4 = 1500.0
elif Parcel_Zone_4 in ['GR1']:
    Floor_Area_WO_Conc_4 = Parcel_Size_4 - 14.0*(math.sqrt(Parcel_Size_4)) + 48.0
elif Parcel_Zone_4 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_WO_Conc_4 = 1.0*Parcel_Size_4
elif Parcel_Zone_4 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_WO_Conc_4 = 1.5*Parcel_Size_4
elif Parcel_Zone_4 in ['GB2','GB3']:
    Floor_Area_WO_Conc_4 = 2.0*Parcel_Size_4
elif Parcel_Zone_4 in ['GR5']:
    Floor_Area_WO_Conc_4 = 2.5*Parcel_Size_4
elif Parcel_Zone_4 in ['GB4']:
    Floor_Area_WO_Conc_4 = 3.0*Parcel_Size_4
elif Parcel_Zone_4 in ['GB5','MU2','GI2']:
    Floor_Area_WO_Conc_4 = 4.0*Parcel_Size_4
elif Parcel_Zone_4 in ['GR6']:
    Floor_Area_WO_Conc_4 = 5.0*Parcel_Size_4
elif Parcel_Zone_4 in ['GB6','MU3']:
    Floor_Area_WO_Conc_4 = 6.0*Parcel_Size_4
elif Parcel_Zone_4 in ['GB7']:
    Floor_Area_WO_Conc_4 = 12.0*Parcel_Size_4
elif Parcel_Zone_4 in ['GI1']:
    Floor_Area_WO_Conc_4 = 1.5*Parcel_Size_4
elif Parcel_Zone_4 in ['GI2']:
    Floor_Area_WO_Conc_4 = 4.0*Parcel_Size_4
elif Parcel_Zone_4 in ['None','LU','TR','OS','CO']:
    Floor_Area_WO_Conc_4 = 0.0*Parcel_Size_4
else:
    print 'ERROR: Floor Area Without Concessions 4'

#Zone 4 With Concession Floor Area Calculations
if Pref_LU_Zone_4 in ['SR1']:
    if Parcel_Size_4 <= 650.0:
        Floor_Area_W_Conc_4 = 1.0*Parcel_Size_4
    elif Parcel_Size_4 > 650.0:
        Floor_Area_W_Conc_4 = 1500.0
elif Pref_LU_Zone_4 in ['GR1']:
    Floor_Area_W_Conc_4 = Parcel_Size_4 - 14.0*(math.sqrt(Parcel_Size_4)) + 48.0

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elif Pref_LU_Zone_4 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_W_Conc_4 = 1.0*Parcel_Size_4
elif Pref_LU_Zone_4 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_W_Conc_4 = 1.5*Parcel_Size_4
elif Pref_LU_Zone_4 in ['GB2','GB3']:
    Floor_Area_W_Conc_4 = 2.0*Parcel_Size_4
elif Pref_LU_Zone_4 in ['GR5']:
    Floor_Area_W_Conc_4 = 2.5*Parcel_Size_4
elif Pref_LU_Zone_4 in ['GB4']:
    Floor_Area_W_Conc_4 = 3.0*Parcel_Size_4
elif Pref_LU_Zone_4 in ['GB5','MU2','GI2']:
    Floor_Area_W_Conc_4 = 4.0*Parcel_Size_4
elif Pref_LU_Zone_4 in ['GR6']:
    Floor_Area_W_Conc_4 = 5.0*Parcel_Size_4
elif Pref_LU_Zone_4 in ['GB6','MU3']:
    Floor_Area_W_Conc_4 = 6.0*Parcel_Size_4
elif Pref_LU_Zone_4 in ['GB7']:
    Floor_Area_W_Conc_4 = 12.0*Parcel_Size_4
elif Parcel_Zone_4 in ['GI1']:
    Floor_Area_W_Conc_4 = 1.5*Parcel_Size_4
elif Parcel_Zone_4 in ['GI2']:
    Floor_Area_W_Conc_4 = 4.0*Parcel_Size_4
else:
    print 'ERROR: Floor Area Conc 4'

#Zone 5 No Concession Floor Area Calculations
if Parcel_Zone_5 in ['SR1']:
    if Parcel_Size_5 <= 650.0:
        Floor_Area_WO_Conc_5 = 1.0*Parcel_Size_5
    elif Parcel_Size_5 > 650.0:
        Floor_Area_WO_Conc_5 = 1500.0
elif Parcel_Zone_5 in ['GR1']:
    Floor_Area_WO_Conc_5 = Parcel_Size_5 - 14.0*(math.sqrt(Parcel_Size_5)) + 48.0
elif Parcel_Zone_5 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_WO_Conc_5 = 1.0*Parcel_Size_5
elif Parcel_Zone_5 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_WO_Conc_5 = 1.5*Parcel_Size_5
elif Parcel_Zone_5 in ['GB2','GB3']:
    Floor_Area_WO_Conc_5 = 2.0*Parcel_Size_5
elif Parcel_Zone_5 in ['GR5']:
    Floor_Area_WO_Conc_5 = 2.5*Parcel_Size_5
elif Parcel_Zone_5 in ['GB4']:
    Floor_Area_WO_Conc_5 = 3.0*Parcel_Size_5
elif Parcel_Zone_5 in ['GB5','MU2','GI2']:
    Floor_Area_WO_Conc_5 = 4.0*Parcel_Size_5
elif Parcel_Zone_5 in ['GR6']:
    Floor_Area_WO_Conc_5 = 5.0*Parcel_Size_5
elif Parcel_Zone_5 in ['GB6','MU3']:
    Floor_Area_WO_Conc_5 = 6.0*Parcel_Size_5
elif Parcel_Zone_5 in ['GB7']:
    Floor_Area_WO_Conc_5 = 12.0*Parcel_Size_5
elif Parcel_Zone_5 in ['GI1']:
    Floor_Area_WO_Conc_5 = 1.5*Parcel_Size_5
elif Parcel_Zone_5 in ['GI2']:
    Floor_Area_WO_Conc_5 = 4.0*Parcel_Size_5
elif Parcel_Zone_5 in ['None','LU','TR','OS','CO']:
    Floor_Area_WO_Conc_5 = 0.0*Parcel_Size_5
else:
    print 'ERROR: Floor Area Without Concessions 5'

#Zone 5 With Concession Floor Area Calculations
if Pref_LU_Zone_5 in ['SR1']:
    if Parcel_Size_5 <= 650.0:
        Floor_Area_W_Conc_5 = 1.0*Parcel_Size_5
    elif Parcel_Size_5 > 650.0:
        Floor_Area_W_Conc_5 = 1500.0

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elif Pref_LU_Zone_5 in ['GR1']:
    Floor_Area_W_Conc_5 = Parcel_Size_5 - 14.0*(math.sqrt(Parcel_Size_5)) + 48.0
elif Pref_LU_Zone_5 in ['SR2','GR2','GR3','LB1','LB2']:
    Floor_Area_W_Conc_5 = 1.0*Parcel_Size_5
elif Pref_LU_Zone_5 in ['GR4','GB1','MU1','GI1']:
    Floor_Area_W_Conc_5 = 1.5*Parcel_Size_5
elif Pref_LU_Zone_5 in ['GB2','GB3']:
    Floor_Area_W_Conc_5 = 2.0*Parcel_Size_5
elif Pref_LU_Zone_5 in ['GR5']:
    Floor_Area_W_Conc_5 = 2.5*Parcel_Size_5
elif Pref_LU_Zone_5 in ['GB4']:
    Floor_Area_W_Conc_5 = 3.0*Parcel_Size_5
elif Pref_LU_Zone_5 in ['GB5','MU2','GI2']:
    Floor_Area_W_Conc_5 = 4.0*Parcel_Size_5
elif Pref_LU_Zone_5 in ['GR6']:
    Floor_Area_W_Conc_5 = 5.0*Parcel_Size_5
elif Pref_LU_Zone_5 in ['GB6','MU3']:
    Floor_Area_W_Conc_5 = 6.0*Parcel_Size_5
elif Pref_LU_Zone_5 in ['GB7']:
    Floor_Area_W_Conc_5 = 12.0*Parcel_Size_5
elif Parcel_Zone_5 in ['GI1']:
    Floor_Area_W_Conc_5 = 1.5*Parcel_Size_5
elif Parcel_Zone_5 in ['GI2']:
    Floor_Area_W_Conc_5 = 4.0*Parcel_Size_5
else:
    print 'ERROR: Floor Area Conc 5'

#Floor Area Residential Max No Concessions
Floor_Area_Resi_Max_WO_Conc_1 = Floor_Area_WO_Conc_1*Resi_WO_Conc_1
Floor_Area_Resi_Max_WO_Conc_2 = Floor_Area_WO_Conc_2*Resi_WO_Conc_2
Floor_Area_Resi_Max_WO_Conc_3 = Floor_Area_WO_Conc_3*Resi_WO_Conc_3
Floor_Area_Resi_Max_WO_Conc_4 = Floor_Area_WO_Conc_4*Resi_WO_Conc_4
Floor_Area_Resi_Max_WO_Conc_5 = Floor_Area_WO_Conc_5*Resi_WO_Conc_5

#Floor Area Residential Max With Concessions
Floor_Area_Resi_Max_W_Conc_1 = Floor_Area_W_Conc_1*Resi_W_Conc_1
Floor_Area_Resi_Max_W_Conc_2 = Floor_Area_W_Conc_2*Resi_W_Conc_2
Floor_Area_Resi_Max_W_Conc_3 = Floor_Area_W_Conc_3*Resi_W_Conc_3
Floor_Area_Resi_Max_W_Conc_4 = Floor_Area_W_Conc_4*Resi_W_Conc_4
Floor_Area_Resi_Max_W_Conc_5 = Floor_Area_W_Conc_5*Resi_W_Conc_5

#Number 0 beds No Concessions (for sites 1 to 5)
Bed0_WO_Conc_1 =
int((Perc_0_Bed*(Floor_Area_Resi_Max_WO_Conc_1/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_WO_Conc_1*Size_Parking)+Perc_1_Bed*(
Size_1_Bed+Park_Bay_Res_WO_Conc_1*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_WO_Conc_1*Size_Parking)+Perc_3_Bed
*(Size_3_Bed+Park_Bay_Res_WO_Conc_1*Size_Parking))))
Bed0_WO_Conc_2 =
int((Perc_0_Bed*(Floor_Area_Resi_Max_WO_Conc_2/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_WO_Conc_2*Size_Parking)+Perc_1_Bed*(
Size_1_Bed+Park_Bay_Res_WO_Conc_2*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_WO_Conc_2*Size_Parking)+Perc_3_Bed
*(Size_3_Bed+Park_Bay_Res_WO_Conc_2*Size_Parking))))
Bed0_WO_Conc_3 =
int((Perc_0_Bed*(Floor_Area_Resi_Max_WO_Conc_3/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_WO_Conc_3*Size_Parking)+Perc_1_Bed*(
Size_1_Bed+Park_Bay_Res_WO_Conc_3*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_WO_Conc_3*Size_Parking)+Perc_3_Bed
*(Size_3_Bed+Park_Bay_Res_WO_Conc_3*Size_Parking))))
Bed0_WO_Conc_4 =
int((Perc_0_Bed*(Floor_Area_Resi_Max_WO_Conc_4/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_WO_Conc_4*Size_Parking)+Perc_1_Bed*(
Size_1_Bed+Park_Bay_Res_WO_Conc_4*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_WO_Conc_4*Size_Parking)+Perc_3_Bed
*(Size_3_Bed+Park_Bay_Res_WO_Conc_4*Size_Parking))))
Bed0_WO_Conc_5 =
int((Perc_0_Bed*(Floor_Area_Resi_Max_WO_Conc_5/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_WO_Conc_5*Size_Parking)+Perc_1_Bed*(
Size_1_Bed+Park_Bay_Res_WO_Conc_5*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_WO_Conc_5*Size_Parking)+Perc_3_Bed
*(Size_3_Bed+Park_Bay_Res_WO_Conc_5*Size_Parking))))
#Number 0 beds With Concessions (for sites 1 to 5)
Bed0_W_Conc_1 =
int((Perc_0_Bed*(Floor_Area_Resi_Max_W_Conc_1/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_W_Conc_1*Size_Parking)+Perc_1_Bed*(Siz

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[illegible]


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Bed3_W_Conc_2 =
int(Perc_3_Bed*(Floor_Area_Resi_Max_W_Conc_2/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_W_Conc_2*Size_Parking)+Perc_1_Bed*(Size_1_Bed+Park_Bay_Res_W_Conc_2*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_W_Conc_2*Size_Parking)+Perc_3_Bed*(Size_3_Bed+Park_Bay_Res_W_Conc_2*Size_Parking))))

Bed3_W_Conc_3 =
int(Perc_3_Bed*(Floor_Area_Resi_Max_W_Conc_3/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_W_Conc_3*Size_Parking)+Perc_1_Bed*(Size_1_Bed+Park_Bay_Res_W_Conc_3*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_W_Conc_3*Size_Parking)+Perc_3_Bed*(Size_3_Bed+Park_Bay_Res_W_Conc_3*Size_Parking))))

Bed3_W_Conc_4 =
int(Perc_3_Bed*(Floor_Area_Resi_Max_W_Conc_4/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_W_Conc_4*Size_Parking)+Perc_1_Bed*(Size_1_Bed+Park_Bay_Res_W_Conc_4*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_W_Conc_4*Size_Parking)+Perc_3_Bed*(Size_3_Bed+Park_Bay_Res_W_Conc_4*Size_Parking))))

Bed3_W_Conc_5 =
int(Perc_3_Bed*(Floor_Area_Resi_Max_W_Conc_5/(Perc_0_Bed*(Size_0_Bed+Park_Bay_Res_W_Conc_5*Size_Parking)+Perc_1_Bed*(Size_1_Bed+Park_Bay_Res_W_Conc_5*Size_Parking)+Perc_2_Bed*(Size_2_Bed+Park_Bay_Res_W_Conc_5*Size_Parking)+Perc_3_Bed*(Size_3_Bed+Park_Bay_Res_W_Conc_5*Size_Parking))))

#Number DU's total No Concessions (for sites 1 to 5)
DU_WO_Conc_1 = Bed0_WO_Conc_1 + Bed1_WO_Conc_1 + Bed2_WO_Conc_1 + Bed3_WO_Conc_1
DU_WO_Conc_2 = Bed0_WO_Conc_2 + Bed1_WO_Conc_2 + Bed2_WO_Conc_2 + Bed3_WO_Conc_2
DU_WO_Conc_3 = Bed0_WO_Conc_3 + Bed1_WO_Conc_3 + Bed2_WO_Conc_3 + Bed3_WO_Conc_3
DU_WO_Conc_4 = Bed0_WO_Conc_4 + Bed1_WO_Conc_4 + Bed2_WO_Conc_4 + Bed3_WO_Conc_4
DU_WO_Conc_5 = Bed0_WO_Conc_5 + Bed1_WO_Conc_5 + Bed2_WO_Conc_5 + Bed3_WO_Conc_5

#Number DU's total With Concessions (for sites 1 to 5)
DU_W_Conc_1 = Bed0_W_Conc_1 + Bed1_W_Conc_1 + Bed2_W_Conc_1 + Bed3_W_Conc_1
DU_W_Conc_2 = Bed0_W_Conc_2 + Bed1_W_Conc_2 + Bed2_W_Conc_2 + Bed3_W_Conc_2
DU_W_Conc_3 = Bed0_W_Conc_3 + Bed1_W_Conc_3 + Bed2_W_Conc_3 + Bed3_W_Conc_3
DU_W_Conc_4 = Bed0_W_Conc_4 + Bed1_W_Conc_4 + Bed2_W_Conc_4 + Bed3_W_Conc_4
DU_W_Conc_5 = Bed0_W_Conc_5 + Bed1_W_Conc_5 + Bed2_W_Conc_5 + Bed3_W_Conc_5

#Floor Area Residential Open Market No Concessions
Floor_Area_Resi_Open_WO_Conc_1 = Bed0_WO_Conc_1*Size_0_Bed + Bed1_WO_Conc_1*Size_1_Bed + Bed2_WO_Conc_1*Size_2_Bed + Bed3_WO_Conc_1*Size_3_Bed
Floor_Area_Resi_Open_WO_Conc_2 = Bed0_WO_Conc_2*Size_0_Bed + Bed1_WO_Conc_2*Size_1_Bed + Bed2_WO_Conc_2*Size_2_Bed + Bed3_WO_Conc_2*Size_3_Bed
Floor_Area_Resi_Open_WO_Conc_3 = Bed0_WO_Conc_3*Size_0_Bed + Bed1_WO_Conc_3*Size_1_Bed + Bed2_WO_Conc_3*Size_2_Bed + Bed3_WO_Conc_3*Size_3_Bed
Floor_Area_Resi_Open_WO_Conc_4 = Bed0_WO_Conc_4*Size_0_Bed + Bed1_WO_Conc_4*Size_1_Bed + Bed2_WO_Conc_4*Size_2_Bed + Bed3_WO_Conc_4*Size_3_Bed
Floor_Area_Resi_Open_WO_Conc_5 = Bed0_WO_Conc_5*Size_0_Bed + Bed1_WO_Conc_5*Size_1_Bed + Bed2_WO_Conc_5*Size_2_Bed + Bed3_WO_Conc_5*Size_3_Bed

#Floor Area Residential Open Market Parking No Concessions
Floor_Area_Resi_Parking_WO_Conc_1 = Size_Parking*DU_WO_Conc_1*Park_Bay_Res_WO_Conc_1
Floor_Area_Resi_Parking_WO_Conc_2 = Size_Parking*DU_WO_Conc_2*Park_Bay_Res_WO_Conc_2
Floor_Area_Resi_Parking_WO_Conc_3 = Size_Parking*DU_WO_Conc_3*Park_Bay_Res_WO_Conc_3
Floor_Area_Resi_Parking_WO_Conc_4 = Size_Parking*DU_WO_Conc_4*Park_Bay_Res_WO_Conc_4
Floor_Area_Resi_Parking_WO_Conc_5 = Size_Parking*DU_WO_Conc_5*Park_Bay_Res_WO_Conc_5

#Floor Area Residential Low Income With Concessions
Floor_Area_Resi_Low_W_Conc_1 =
Resi_Low_W_Conc*(Size_0_Bed*Bed0_W_Conc_1+Size_1_Bed*Bed1_W_Conc_1+Size_2_Bed*Bed2_W_Conc_1+Size_3_Bed*Bed3_W_Conc_1)

Floor_Area_Resi_Low_W_Conc_2 =
Resi_Low_W_Conc*(Size_0_Bed*Bed0_W_Conc_2+Size_1_Bed*Bed1_W_Conc_2+Size_2_Bed*Bed2_W_Conc_2+Size_3_Bed*Bed3_W_Conc_2)

Floor_Area_Resi_Low_W_Conc_3 =
Resi_Low_W_Conc*(Size_0_Bed*Bed0_W_Conc_3+Size_1_Bed*Bed1_W_Conc_3+Size_2_Bed*Bed2_W_Conc_3+Size_3_Bed*Bed3_W_Conc_3)

Floor_Area_Resi_Low_W_Conc_4 =
Resi_Low_W_Conc*(Size_0_Bed*Bed0_W_Conc_4+Size_1_Bed*Bed1_W_Conc_4+Size_2_Bed*Bed2_W_Conc_4+Size_3_Bed*Bed3_W_Conc_4)

Floor_Area_Resi_Low_W_Conc_5 =
Resi_Low_W_Conc*(Size_0_Bed*Bed0_W_Conc_5+Size_1_Bed*Bed1_W_Conc_5+Size_2_Bed*Bed2_W_Conc_5+Size_3_Bed*Bed3_W_Conc_5)

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#Floor Area Residential Med Income With Concessions

Floor_Area_Resi_Med_W_Conc_1 =
 Resi_Med_W_Conc*(Size_0_Bed*Bed0_W_Conc_1+Size_1_Bed*Bed1_W_Conc_1+Size_2_Bed*Bed2_W_Conc_1+Size_3_Bed*Bed3_W_Conc_1)
 Floor_Area_Resi_Med_W_Conc_2 =
 Resi_Med_W_Conc*(Size_0_Bed*Bed0_W_Conc_2+Size_1_Bed*Bed1_W_Conc_2+Size_2_Bed*Bed2_W_Conc_2+Size_3_Bed*Bed3_W_Conc_2)
 Floor_Area_Resi_Med_W_Conc_3 =
 Resi_Med_W_Conc*(Size_0_Bed*Bed0_W_Conc_3+Size_1_Bed*Bed1_W_Conc_3+Size_2_Bed*Bed2_W_Conc_3+Size_3_Bed*Bed3_W_Conc_3)
 Floor_Area_Resi_Med_W_Conc_4 =
 Resi_Med_W_Conc*(Size_0_Bed*Bed0_W_Conc_4+Size_1_Bed*Bed1_W_Conc_4+Size_2_Bed*Bed2_W_Conc_4+Size_3_Bed*Bed3_W_Conc_4)
 Floor_Area_Resi_Med_W_Conc_5 =
 Resi_Med_W_Conc*(Size_0_Bed*Bed0_W_Conc_5+Size_1_Bed*Bed1_W_Conc_5+Size_2_Bed*Bed2_W_Conc_5+Size_3_Bed*Bed3_W_Conc_5)

#Floor Area Residential Open Market With Concessions

Floor_Area_Resi_Open_W_Conc_1 =
 Resi_Open_W_Conc*(Size_0_Bed*Bed0_W_Conc_1+Size_1_Bed*Bed1_W_Conc_1+Size_2_Bed*Bed2_W_Conc_1+Size_3_Bed*Bed3_W_Conc_1)
 Floor_Area_Resi_Open_W_Conc_2 =
 Resi_Open_W_Conc*(Size_0_Bed*Bed0_W_Conc_2+Size_1_Bed*Bed1_W_Conc_2+Size_2_Bed*Bed2_W_Conc_2+Size_3_Bed*Bed3_W_Conc_2)
 Floor_Area_Resi_Open_W_Conc_3 =
 Resi_Open_W_Conc*(Size_0_Bed*Bed0_W_Conc_3+Size_1_Bed*Bed1_W_Conc_3+Size_2_Bed*Bed2_W_Conc_3+Size_3_Bed*Bed3_W_Conc_3)
 Floor_Area_Resi_Open_W_Conc_4 =
 Resi_Open_W_Conc*(Size_0_Bed*Bed0_W_Conc_4+Size_1_Bed*Bed1_W_Conc_4+Size_2_Bed*Bed2_W_Conc_4+Size_3_Bed*Bed3_W_Conc_4)
 Floor_Area_Resi_Open_W_Conc_5 =
 Resi_Open_W_Conc*(Size_0_Bed*Bed0_W_Conc_5+Size_1_Bed*Bed1_W_Conc_5+Size_2_Bed*Bed2_W_Conc_5+Size_3_Bed*Bed3_W_Conc_5)

#Floor Area Residential Total With Concessions

Floor_Area_Resi_Total_W_Conc_1 = Floor_Area_Resi_Low_W_Conc_1 + Floor_Area_Resi_Med_W_Conc_1 +
 Floor_Area_Resi_Open_W_Conc_1
 Floor_Area_Resi_Total_W_Conc_2 = Floor_Area_Resi_Low_W_Conc_2 + Floor_Area_Resi_Med_W_Conc_2 +
 Floor_Area_Resi_Open_W_Conc_2
 Floor_Area_Resi_Total_W_Conc_3 = Floor_Area_Resi_Low_W_Conc_3 + Floor_Area_Resi_Med_W_Conc_3 +
 Floor_Area_Resi_Open_W_Conc_3
 Floor_Area_Resi_Total_W_Conc_4 = Floor_Area_Resi_Low_W_Conc_4 + Floor_Area_Resi_Med_W_Conc_4 +
 Floor_Area_Resi_Open_W_Conc_4
 Floor_Area_Resi_Total_W_Conc_5 = Floor_Area_Resi_Low_W_Conc_5 + Floor_Area_Resi_Med_W_Conc_5 +
 Floor_Area_Resi_Open_W_Conc_5

#Floor Area Residential Parking With Concessions

Floor_Area_Resi_Parking_W_Conc_1 = Size_Parking*DU_W_Conc_1*Park_Bay_Res_W_Conc_1
 Floor_Area_Resi_Parking_W_Conc_2 = Size_Parking*DU_W_Conc_2*Park_Bay_Res_W_Conc_2
 Floor_Area_Resi_Parking_W_Conc_3 = Size_Parking*DU_W_Conc_3*Park_Bay_Res_W_Conc_3
 Floor_Area_Resi_Parking_W_Conc_4 = Size_Parking*DU_W_Conc_4*Park_Bay_Res_W_Conc_4
 Floor_Area_Resi_Parking_W_Conc_5 = Size_Parking*DU_W_Conc_5*Park_Bay_Res_W_Conc_5

#Floor Area Office No Concessions

Floor_Area_Office_WO_Conc_1 = (Office_WO_Conc_1*Floor_Area_WO_Conc_1)/((Park_Bay_Office_WO_Conc_1*Size_Parking/100)+1)
 Floor_Area_Office_WO_Conc_2 = (Office_WO_Conc_2*Floor_Area_WO_Conc_2)/((Park_Bay_Office_WO_Conc_2*Size_Parking/100)+1)
 Floor_Area_Office_WO_Conc_3 = (Office_WO_Conc_3*Floor_Area_WO_Conc_3)/((Park_Bay_Office_WO_Conc_3*Size_Parking/100)+1)
 Floor_Area_Office_WO_Conc_4 = (Office_WO_Conc_4*Floor_Area_WO_Conc_4)/((Park_Bay_Office_WO_Conc_4*Size_Parking/100)+1)
 Floor_Area_Office_WO_Conc_5 = (Office_WO_Conc_5*Floor_Area_WO_Conc_5)/((Park_Bay_Office_WO_Conc_5*Size_Parking/100)+1)

#Floor Area Office Parking No Concessions

Floor_Area_Office_Parking_WO_Conc_1 = Floor_Area_Office_WO_Conc_1*Park_Bay_Retail_WO_Conc_1/100*Size_Parking
 Floor_Area_Office_Parking_WO_Conc_2 = Floor_Area_Office_WO_Conc_2*Park_Bay_Retail_WO_Conc_2/100*Size_Parking
 Floor_Area_Office_Parking_WO_Conc_3 = Floor_Area_Office_WO_Conc_3*Park_Bay_Retail_WO_Conc_3/100*Size_Parking
 Floor_Area_Office_Parking_WO_Conc_4 = Floor_Area_Office_WO_Conc_4*Park_Bay_Retail_WO_Conc_4/100*Size_Parking
 Floor_Area_Office_Parking_WO_Conc_5 = Floor_Area_Office_WO_Conc_5*Park_Bay_Retail_WO_Conc_5/100*Size_Parking

#Floor Area Office With Concessions

Floor_Area_Office_W_Conc_1 = (Office_W_Conc_1*Floor_Area_W_Conc_1)/((Park_Bay_Office_W_Conc_1*Size_Parking/100)+1)
Floor_Area_Office_W_Conc_2 = (Office_W_Conc_2*Floor_Area_W_Conc_2)/((Park_Bay_Office_W_Conc_2*Size_Parking/100)+1)
Floor_Area_Office_W_Conc_3 = (Office_W_Conc_3*Floor_Area_W_Conc_3)/((Park_Bay_Office_W_Conc_3*Size_Parking/100)+1)
Floor_Area_Office_W_Conc_4 = (Office_W_Conc_4*Floor_Area_W_Conc_4)/((Park_Bay_Office_W_Conc_4*Size_Parking/100)+1)
Floor_Area_Office_W_Conc_5 = (Office_W_Conc_5*Floor_Area_W_Conc_5)/((Park_Bay_Office_W_Conc_5*Size_Parking/100)+1)

#Floor Area Office Parking With Concessions

Floor_Area_Office_Parking_W_Conc_1 = Floor_Area_Office_W_Conc_1*Park_Bay_Retail_W_Conc_1/100*Size_Parking
Floor_Area_Office_Parking_W_Conc_2 = Floor_Area_Office_W_Conc_2*Park_Bay_Retail_W_Conc_2/100*Size_Parking
Floor_Area_Office_Parking_W_Conc_3 = Floor_Area_Office_W_Conc_3*Park_Bay_Retail_W_Conc_3/100*Size_Parking
Floor_Area_Office_Parking_W_Conc_4 = Floor_Area_Office_W_Conc_4*Park_Bay_Retail_W_Conc_4/100*Size_Parking
Floor_Area_Office_Parking_W_Conc_5 = Floor_Area_Office_W_Conc_5*Park_Bay_Retail_W_Conc_5/100*Size_Parking

#Floor Area Retail No Concessions

Floor_Area_Retail_WO_Conc_1 = (Retail_WO_Conc_1*Floor_Area_WO_Conc_1)/((Park_Bay_Retail_WO_Conc_1*Size_Parking/100)+1)
Floor_Area_Retail_WO_Conc_2 = (Retail_WO_Conc_2*Floor_Area_WO_Conc_2)/((Park_Bay_Retail_WO_Conc_2*Size_Parking/100)+1)
Floor_Area_Retail_WO_Conc_3 = (Retail_WO_Conc_3*Floor_Area_WO_Conc_3)/((Park_Bay_Retail_WO_Conc_3*Size_Parking/100)+1)
Floor_Area_Retail_WO_Conc_4 = (Retail_WO_Conc_4*Floor_Area_WO_Conc_4)/((Park_Bay_Retail_WO_Conc_4*Size_Parking/100)+1)
Floor_Area_Retail_WO_Conc_5 = (Retail_WO_Conc_5*Floor_Area_WO_Conc_5)/((Park_Bay_Retail_WO_Conc_5*Size_Parking/100)+1)

#Floor Area Retail Parking No Concessions

Floor_Area_Retail_Parking_WO_Conc_1 = Floor_Area_Retail_WO_Conc_1*Park_Bay_Retail_WO_Conc_1/100*Size_Parking
Floor_Area_Retail_Parking_WO_Conc_2 = Floor_Area_Retail_WO_Conc_2*Park_Bay_Retail_WO_Conc_2/100*Size_Parking
Floor_Area_Retail_Parking_WO_Conc_3 = Floor_Area_Retail_WO_Conc_3*Park_Bay_Retail_WO_Conc_3/100*Size_Parking
Floor_Area_Retail_Parking_WO_Conc_4 = Floor_Area_Retail_WO_Conc_4*Park_Bay_Retail_WO_Conc_4/100*Size_Parking
Floor_Area_Retail_Parking_WO_Conc_5 = Floor_Area_Retail_WO_Conc_5*Park_Bay_Retail_WO_Conc_5/100*Size_Parking

#Floor Area Retail With Concessions

Floor_Area_Retail_W_Conc_1 = (Retail_W_Conc_1*Floor_Area_W_Conc_1)/((Park_Bay_Retail_W_Conc_1*Size_Parking/100)+1)
Floor_Area_Retail_W_Conc_2 = (Retail_W_Conc_2*Floor_Area_W_Conc_2)/((Park_Bay_Retail_W_Conc_2*Size_Parking/100)+1)
Floor_Area_Retail_W_Conc_3 = (Retail_W_Conc_3*Floor_Area_W_Conc_3)/((Park_Bay_Retail_W_Conc_3*Size_Parking/100)+1)
Floor_Area_Retail_W_Conc_4 = (Retail_W_Conc_4*Floor_Area_W_Conc_4)/((Park_Bay_Retail_W_Conc_4*Size_Parking/100)+1)
Floor_Area_Retail_W_Conc_5 = (Retail_W_Conc_5*Floor_Area_W_Conc_5)/((Park_Bay_Retail_W_Conc_5*Size_Parking/100)+1)

#Floor Area Retail Parking With Concessions

Floor_Area_Retail_Parking_W_Conc_1 = Floor_Area_Retail_W_Conc_1*Park_Bay_Retail_W_Conc_1/100*Size_Parking
Floor_Area_Retail_Parking_W_Conc_2 = Floor_Area_Retail_W_Conc_2*Park_Bay_Retail_W_Conc_2/100*Size_Parking
Floor_Area_Retail_Parking_W_Conc_3 = Floor_Area_Retail_W_Conc_3*Park_Bay_Retail_W_Conc_3/100*Size_Parking
Floor_Area_Retail_Parking_W_Conc_4 = Floor_Area_Retail_W_Conc_4*Park_Bay_Retail_W_Conc_4/100*Size_Parking
Floor_Area_Retail_Parking_W_Conc_5 = Floor_Area_Retail_W_Conc_5*Park_Bay_Retail_W_Conc_5/100*Size_Parking

#Floor Area Parking Total No Concessions

Floor_Area_Total_Parking_WO_Conc_1 = Floor_Area_Resi_Parking_WO_Conc_1 + Floor_Area_Office_Parking_WO_Conc_1 +
Floor_Area_Retail_Parking_WO_Conc_1
Floor_Area_Total_Parking_WO_Conc_2 = Floor_Area_Resi_Parking_WO_Conc_2 + Floor_Area_Office_Parking_WO_Conc_2 +
Floor_Area_Retail_Parking_WO_Conc_2
Floor_Area_Total_Parking_WO_Conc_3 = Floor_Area_Resi_Parking_WO_Conc_3 + Floor_Area_Office_Parking_WO_Conc_3 +
Floor_Area_Retail_Parking_WO_Conc_3
Floor_Area_Total_Parking_WO_Conc_4 = Floor_Area_Resi_Parking_WO_Conc_4 + Floor_Area_Office_Parking_WO_Conc_4 +
Floor_Area_Retail_Parking_WO_Conc_4
Floor_Area_Total_Parking_WO_Conc_5 = Floor_Area_Resi_Parking_WO_Conc_5 + Floor_Area_Office_Parking_WO_Conc_5 +
Floor_Area_Retail_Parking_WO_Conc_5

#Floor Area Parking Total With Concessions

Floor_Area_Total_Parking_W_Conc_1 = Floor_Area_Resi_Parking_W_Conc_1 + Floor_Area_Office_Parking_W_Conc_1 +
Floor_Area_Retail_Parking_W_Conc_1
Floor_Area_Total_Parking_W_Conc_2 = Floor_Area_Resi_Parking_W_Conc_2 + Floor_Area_Office_Parking_W_Conc_2 +
Floor_Area_Retail_Parking_W_Conc_2
Floor_Area_Total_Parking_W_Conc_3 = Floor_Area_Resi_Parking_W_Conc_3 + Floor_Area_Office_Parking_W_Conc_3 +
Floor_Area_Retail_Parking_W_Conc_3
Floor_Area_Total_Parking_W_Conc_4 = Floor_Area_Resi_Parking_W_Conc_4 + Floor_Area_Office_Parking_W_Conc_4 +
Floor_Area_Retail_Parking_W_Conc_4

Floor_Area_Total_Parking_W_Conc_5 = Floor_Area_Resi_Parking_W_Conc_5 + Floor_Area_Office_Parking_W_Conc_5 +
 Floor_Area_Retail_Parking_W_Conc_5

```

print ""
print Floor_Area_Retail_WO_Conc_1
print Floor_Area_Retail_WO_Conc_2
print Floor_Area_Retail_WO_Conc_3
print Floor_Area_Retail_WO_Conc_4
print Floor_Area_Retail_WO_Conc_5
print ""
print Floor_Area_Retail_Parking_WO_Conc_1
print Floor_Area_Retail_Parking_WO_Conc_2
print Floor_Area_Retail_Parking_WO_Conc_3
print Floor_Area_Retail_Parking_WO_Conc_4
print Floor_Area_Retail_Parking_WO_Conc_5
print ""
print Floor_Area_Retail_W_Conc_1
print Floor_Area_Retail_W_Conc_2
print Floor_Area_Retail_W_Conc_3
print Floor_Area_Retail_W_Conc_4
print Floor_Area_Retail_W_Conc_5
print ""
print Floor_Area_Retail_Parking_W_Conc_1
print Floor_Area_Retail_Parking_W_Conc_2
print Floor_Area_Retail_Parking_W_Conc_3
print Floor_Area_Retail_Parking_W_Conc_4
print Floor_Area_Retail_Parking_W_Conc_5
print ""

print 'Parcel Size 1:', Parcel_Size_1
print 'Zone Without Conc 1:', Parcel_Zone_1
print 'Zone With Conc 1:', Pref_LU_Zone_1
print 'Max floor Area Without Concessions 1:', Floor_Area_WO_Conc_1
print 'Max floor Area Conc 1:', Floor_Area_W_Conc_1
print ""

print 'Parcel Size 2:', Parcel_Size_2
print 'Zone Without Conc 2:', Parcel_Zone_2
print 'Zone With Conc 2:', Pref_LU_Zone_2
print 'Max floor Area Without Concessions 2:', Floor_Area_WO_Conc_2
print 'Max floor Area Conc 2:', Floor_Area_W_Conc_2
print ""

print 'Parcel Size 3:', Parcel_Size_3
print 'Zone Without Conc 3:', Parcel_Zone_3
print 'Zone With Conc 3:', Pref_LU_Zone_3
print 'Max floor Area Without Concessions 3:', Floor_Area_WO_Conc_3
print 'Max floor Area Conc 3:', Floor_Area_W_Conc_3
print ""

print 'Parcel Size 4:', Parcel_Size_4
print 'Zone Without Conc 4:', Parcel_Zone_4
print 'Zone With Conc 4:', Pref_LU_Zone_4
print 'Max floor Area Without Concessions 4:', Floor_Area_WO_Conc_4
print 'Max floor Area Conc 4:', Floor_Area_W_Conc_4
print ""

print 'Parcel Size 5:', Parcel_Size_5
print 'Zone Without Conc 5:', Parcel_Zone_5
print 'Zone With Conc 5:', Pref_LU_Zone_5
print 'Max floor Area Without Concessions 5:', Floor_Area_WO_Conc_5
print 'Max floor Area Conc 5:', Floor_Area_W_Conc_5

```

Module G – Additional Site Calculations

```
def main():
    pass

if __name__ == '__main__':
    main()

from Raster_Data_Extract_v1 import*
from Initial_Site_Calculations_v1 import*
import math

#Rates Factor Calculation Parcel 1
if Parcel_Zone_1 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_WO_Conc_1 = 0.006717
elif Parcel_Zone_1 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2','None','LU','TR','OS','CO']:
    Rates_Factor_WO_Conc_1 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment WO Conc Parcel 1'

#Rates Factor Calculation Parcel 2
if Parcel_Zone_2 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_WO_Conc_2 = 0.006717
elif Parcel_Zone_2 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2','None','LU','TR','OS','CO']:
    Rates_Factor_WO_Conc_2 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment WO Conc Parcel 2'

#Rates Factor Calculation Parcel 3
if Parcel_Zone_3 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_WO_Conc_3 = 0.006717
elif Parcel_Zone_3 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2','None','LU','TR','OS','CO']:
    Rates_Factor_WO_Conc_3 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment WO Conc Parcel 3'

#Rates Factor Calculation Parcel 4
if Parcel_Zone_4 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_WO_Conc_4 = 0.006717
elif Parcel_Zone_4 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2','None','LU','TR','OS','CO']:
    Rates_Factor_WO_Conc_4 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment WO Conc Parcel 4'

#Rates Factor Calculation Parcel 5
if Parcel_Zone_5 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_WO_Conc_5 = 0.006717
elif Parcel_Zone_5 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2','None','LU','TR','OS','CO']:
    Rates_Factor_WO_Conc_5 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment WO Conc Parcel 5'

#Rates Factor Calculation With Concessions Parcel 1
if Pref_LU_Zone_1 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_W_Conc_1 = 0.006717
elif Pref_LU_Zone_1 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2']:
    Rates_Factor_W_Conc_1 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment W Conc Parcel 1'

#Rates Factor Calculation With Concessions Parcel 2
if Pref_LU_Zone_2 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_W_Conc_2 = 0.006717
elif Pref_LU_Zone_2 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2']:
    Rates_Factor_W_Conc_2 = 0.013434
```

```

else:
    print 'ERROR: Rates Factor Assignment W Conc Parcel 2'

#Rates Factor Calculation With Concessions Parcel 3
if Pref_LU_Zone_3 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_W_Conc_3 = 0.006717
elif Pref_LU_Zone_3 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2']:
    Rates_Factor_W_Conc_3 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment W Conc Parcel 3'

#Rates Factor Calculation With Concessions Parcel 4
if Pref_LU_Zone_4 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_W_Conc_4 = 0.006717
elif Pref_LU_Zone_4 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2']:
    Rates_Factor_W_Conc_4 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment W Conc Parcel 4'

#Rates Factor Calculation With Concessions Parcel 5
if Pref_LU_Zone_5 in ['SR1','SR2','GR1','GR2','GR3','GR4','GR5','GR6']:
    Rates_Factor_W_Conc_5 = 0.006717
elif Pref_LU_Zone_5 in ['LB1','LB2','GB1','GB2','GB3','GB4','GB5','GB6','GB7','MU1','MU2','MU3','GI1','GI2']:
    Rates_Factor_W_Conc_5 = 0.013434
else:
    print 'ERROR: Rates Factor Assignment W Conc Parcel 5'

#Municipal rates per m2 per land parcel without concessions
Muni_Rates_WO_Conc_1 = Rates_Factor_WO_Conc_1*Parcel_Muni_1/12.0
Muni_Rates_WO_Conc_2 = Rates_Factor_WO_Conc_2*Parcel_Muni_2/12.0
Muni_Rates_WO_Conc_3 = Rates_Factor_WO_Conc_3*Parcel_Muni_3/12.0
Muni_Rates_WO_Conc_4 = Rates_Factor_WO_Conc_4*Parcel_Muni_4/12.0
Muni_Rates_WO_Conc_5 = Rates_Factor_WO_Conc_5*Parcel_Muni_5/12.0

#Municipal rates per m2 per land parcel with concessions
Muni_Rates_W_Conc_1 = Rates_Factor_W_Conc_1*Parcel_Muni_1/12.0
Muni_Rates_W_Conc_2 = Rates_Factor_W_Conc_2*Parcel_Muni_2/12.0
Muni_Rates_W_Conc_3 = Rates_Factor_W_Conc_3*Parcel_Muni_3/12.0
Muni_Rates_W_Conc_4 = Rates_Factor_W_Conc_4*Parcel_Muni_4/12.0
Muni_Rates_W_Conc_5 = Rates_Factor_W_Conc_5*Parcel_Muni_5/12.0

print Muni_Rates_WO_Conc_1
print Muni_Rates_WO_Conc_2
print Muni_Rates_WO_Conc_3
print Muni_Rates_WO_Conc_4
print Muni_Rates_WO_Conc_5
print ""
print Muni_Rates_W_Conc_1
print Muni_Rates_W_Conc_2
print Muni_Rates_W_Conc_3
print Muni_Rates_W_Conc_4
print Muni_Rates_W_Conc_5

```

Module H – Site Finance Calculations

```
def main():
    pass

if __name__ == '__main__':
    main()

from Calculations_Floor_Area_v1 import*
from Calculations_Parking_v1 import*
from Additional_Site_Calculations_v1 import*
import math
import datetime
from datetime import datetime

#MONTHLY INCOME:

#Rent Resi Open No Concessions
Rent_Resi_Open_WO_Conc_1 = Parcel_Rent_WO_Conc_Res_1*Floor_Area_Resi_Open_WO_Conc_1*(1-Perc_Resi_Sold_WO_Conc)
Rent_Resi_Open_WO_Conc_2 = Parcel_Rent_WO_Conc_Res_2*Floor_Area_Resi_Open_WO_Conc_2*(1-Perc_Resi_Sold_WO_Conc)
Rent_Resi_Open_WO_Conc_3 = Parcel_Rent_WO_Conc_Res_3*Floor_Area_Resi_Open_WO_Conc_3*(1-Perc_Resi_Sold_WO_Conc)
Rent_Resi_Open_WO_Conc_4 = Parcel_Rent_WO_Conc_Res_4*Floor_Area_Resi_Open_WO_Conc_4*(1-Perc_Resi_Sold_WO_Conc)
Rent_Resi_Open_WO_Conc_5 = Parcel_Rent_WO_Conc_Res_5*Floor_Area_Resi_Open_WO_Conc_5*(1-Perc_Resi_Sold_WO_Conc)

#Rent Resi Open With Concessions
Rent_Resi_Open_W_Conc_1 = Parcel_Rent_W_Conc_Res_1*Floor_Area_Resi_Open_W_Conc_1*(1-Perc_Resi_Sold_W_Conc)
Rent_Resi_Open_W_Conc_2 = Parcel_Rent_W_Conc_Res_2*Floor_Area_Resi_Open_W_Conc_2*(1-Perc_Resi_Sold_W_Conc)
Rent_Resi_Open_W_Conc_3 = Parcel_Rent_W_Conc_Res_3*Floor_Area_Resi_Open_W_Conc_3*(1-Perc_Resi_Sold_W_Conc)
Rent_Resi_Open_W_Conc_4 = Parcel_Rent_W_Conc_Res_4*Floor_Area_Resi_Open_W_Conc_4*(1-Perc_Resi_Sold_W_Conc)
Rent_Resi_Open_W_Conc_5 = Parcel_Rent_W_Conc_Res_5*Floor_Area_Resi_Open_W_Conc_5*(1-Perc_Resi_Sold_W_Conc)

#Rent Resi Med With Concessions
Rent_Resi_Med_W_Conc_1 = Parcel_Rent_WO_Conc_Res_1*Rent_Factor_Med*Floor_Area_Resi_Med_W_Conc_1
Rent_Resi_Med_W_Conc_2 = Parcel_Rent_WO_Conc_Res_2*Rent_Factor_Med*Floor_Area_Resi_Med_W_Conc_2
Rent_Resi_Med_W_Conc_3 = Parcel_Rent_WO_Conc_Res_3*Rent_Factor_Med*Floor_Area_Resi_Med_W_Conc_3
Rent_Resi_Med_W_Conc_4 = Parcel_Rent_WO_Conc_Res_4*Rent_Factor_Med*Floor_Area_Resi_Med_W_Conc_4
Rent_Resi_Med_W_Conc_5 = Parcel_Rent_WO_Conc_Res_5*Rent_Factor_Med*Floor_Area_Resi_Med_W_Conc_5

#Rent Resi Low With Concessions
Rent_Resi_Low_W_Conc_1 = Parcel_Rent_WO_Conc_Res_1*Rent_Factor_Low*Floor_Area_Resi_Low_W_Conc_1
Rent_Resi_Low_W_Conc_2 = Parcel_Rent_WO_Conc_Res_2*Rent_Factor_Low*Floor_Area_Resi_Low_W_Conc_2
Rent_Resi_Low_W_Conc_3 = Parcel_Rent_WO_Conc_Res_3*Rent_Factor_Low*Floor_Area_Resi_Low_W_Conc_3
Rent_Resi_Low_W_Conc_4 = Parcel_Rent_WO_Conc_Res_4*Rent_Factor_Low*Floor_Area_Resi_Low_W_Conc_4
Rent_Resi_Low_W_Conc_5 = Parcel_Rent_WO_Conc_Res_5*Rent_Factor_Low*Floor_Area_Resi_Low_W_Conc_5

#Rent Office No Concessions
Rent_Office_WO_Conc_1 = Parcel_Rent_Office_1*Floor_Area_Office_WO_Conc_1
Rent_Office_WO_Conc_2 = Parcel_Rent_Office_2*Floor_Area_Office_WO_Conc_2
Rent_Office_WO_Conc_3 = Parcel_Rent_Office_3*Floor_Area_Office_WO_Conc_3
Rent_Office_WO_Conc_4 = Parcel_Rent_Office_4*Floor_Area_Office_WO_Conc_4
Rent_Office_WO_Conc_5 = Parcel_Rent_Office_5*Floor_Area_Office_WO_Conc_5

#Rent Office With Concessions
Rent_Office_W_Conc_1 = Parcel_Rent_Office_1*Floor_Area_Office_W_Conc_1
Rent_Office_W_Conc_2 = Parcel_Rent_Office_2*Floor_Area_Office_W_Conc_2
Rent_Office_W_Conc_3 = Parcel_Rent_Office_3*Floor_Area_Office_W_Conc_3
Rent_Office_W_Conc_4 = Parcel_Rent_Office_4*Floor_Area_Office_W_Conc_4
Rent_Office_W_Conc_5 = Parcel_Rent_Office_5*Floor_Area_Office_W_Conc_5

#Rent Retail No Concessions
Rent_Retail_WO_Conc_1 = Parcel_Rent_Retail_1*Floor_Area_Retail_WO_Conc_1
Rent_Retail_WO_Conc_2 = Parcel_Rent_Retail_2*Floor_Area_Retail_WO_Conc_2
Rent_Retail_WO_Conc_3 = Parcel_Rent_Retail_3*Floor_Area_Retail_WO_Conc_3
Rent_Retail_WO_Conc_4 = Parcel_Rent_Retail_4*Floor_Area_Retail_WO_Conc_4
Rent_Retail_WO_Conc_5 = Parcel_Rent_Retail_5*Floor_Area_Retail_WO_Conc_5
```

#Rent Retail With Concessions

Rent_Retail_W_Conc_1 = Parcel_Rent_Retail_1*Floor_Area_Retail_W_Conc_1
Rent_Retail_W_Conc_2 = Parcel_Rent_Retail_2*Floor_Area_Retail_W_Conc_2
Rent_Retail_W_Conc_3 = Parcel_Rent_Retail_3*Floor_Area_Retail_W_Conc_3
Rent_Retail_W_Conc_4 = Parcel_Rent_Retail_4*Floor_Area_Retail_W_Conc_4
Rent_Retail_W_Conc_5 = Parcel_Rent_Retail_5*Floor_Area_Retail_W_Conc_5

#Rent Parking Resi No Concessions

Rent_Parking_Resi_WO_Conc_1 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Resi_Parking_WO_Conc_1*(1-Perc_Resi_Sold_WO_Conc)
Rent_Parking_Resi_WO_Conc_2 = Parcel_Rent_Parking_WO_Conc_2*Floor_Area_Resi_Parking_WO_Conc_2*(1-Perc_Resi_Sold_WO_Conc)
Rent_Parking_Resi_WO_Conc_3 = Parcel_Rent_Parking_WO_Conc_3*Floor_Area_Resi_Parking_WO_Conc_3*(1-Perc_Resi_Sold_WO_Conc)
Rent_Parking_Resi_WO_Conc_4 = Parcel_Rent_Parking_WO_Conc_4*Floor_Area_Resi_Parking_WO_Conc_4*(1-Perc_Resi_Sold_WO_Conc)
Rent_Parking_Resi_WO_Conc_5 = Parcel_Rent_Parking_WO_Conc_5*Floor_Area_Resi_Parking_WO_Conc_5*(1-Perc_Resi_Sold_WO_Conc)

#Rent Parking Resi With Concessions

Rent_Parking_Resi_W_Conc_1 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Resi_Parking_W_Conc_1*(1-Perc_Resi_Sold_W_Conc)
Rent_Parking_Resi_W_Conc_2 = Parcel_Rent_Parking_W_Conc_2*Floor_Area_Resi_Parking_W_Conc_2*(1-Perc_Resi_Sold_W_Conc)
Rent_Parking_Resi_W_Conc_3 = Parcel_Rent_Parking_W_Conc_3*Floor_Area_Resi_Parking_W_Conc_3*(1-Perc_Resi_Sold_W_Conc)
Rent_Parking_Resi_W_Conc_4 = Parcel_Rent_Parking_W_Conc_4*Floor_Area_Resi_Parking_W_Conc_4*(1-Perc_Resi_Sold_W_Conc)
Rent_Parking_Resi_W_Conc_5 = Parcel_Rent_Parking_W_Conc_5*Floor_Area_Resi_Parking_W_Conc_5*(1-Perc_Resi_Sold_W_Conc)

#Rent Parking Office No Concessions

Rent_Parking_Office_WO_Conc_1 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Office_Parking_WO_Conc_1
Rent_Parking_Office_WO_Conc_2 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Office_Parking_WO_Conc_2
Rent_Parking_Office_WO_Conc_3 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Office_Parking_WO_Conc_3
Rent_Parking_Office_WO_Conc_4 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Office_Parking_WO_Conc_4
Rent_Parking_Office_WO_Conc_5 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Office_Parking_WO_Conc_5

#Rent Parking Office With Concessions

Rent_Parking_Office_W_Conc_1 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Office_Parking_W_Conc_1
Rent_Parking_Office_W_Conc_2 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Office_Parking_W_Conc_2
Rent_Parking_Office_W_Conc_3 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Office_Parking_W_Conc_3
Rent_Parking_Office_W_Conc_4 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Office_Parking_W_Conc_4
Rent_Parking_Office_W_Conc_5 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Office_Parking_W_Conc_5

#Rent Parking Retail No Concessions

Rent_Parking_Retail_WO_Conc_1 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Retail_Parking_WO_Conc_1
Rent_Parking_Retail_WO_Conc_2 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Retail_Parking_WO_Conc_2
Rent_Parking_Retail_WO_Conc_3 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Retail_Parking_WO_Conc_3
Rent_Parking_Retail_WO_Conc_4 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Retail_Parking_WO_Conc_4
Rent_Parking_Retail_WO_Conc_5 = Parcel_Rent_Parking_WO_Conc_1*Floor_Area_Retail_Parking_WO_Conc_5

#Rent Parking Retail With Concessions

Rent_Parking_Retail_W_Conc_1 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Retail_Parking_W_Conc_1
Rent_Parking_Retail_W_Conc_2 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Retail_Parking_W_Conc_2
Rent_Parking_Retail_W_Conc_3 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Retail_Parking_W_Conc_3
Rent_Parking_Retail_W_Conc_4 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Retail_Parking_W_Conc_4
Rent_Parking_Retail_W_Conc_5 = Parcel_Rent_Parking_W_Conc_1*Floor_Area_Retail_Parking_W_Conc_5

#Levies Income Sold Open Market Units No Concessions

Levies_WO_Conc_1 = Maintenance_Building*Perc_Resi_Sold_WO_Conc*Floor_Area_Resi_Open_WO_Conc_1+Maintenance_Building*Perc_Resi_Sold_WO_Conc*Floor_Area_Resi_Parking_WO_Conc_1
Levies_WO_Conc_2 = Maintenance_Building*Perc_Resi_Sold_WO_Conc*Floor_Area_Resi_Open_WO_Conc_2+Maintenance_Building*Perc_Resi_Sold_WO_Conc*Floor_Area_Resi_Parking_WO_Conc_2
Levies_WO_Conc_3 = Maintenance_Building*Perc_Resi_Sold_WO_Conc*Floor_Area_Resi_Open_WO_Conc_3+Maintenance_Building*Perc_Resi_Sold_WO_Conc*Floor_Area_Resi_Parking_WO_Conc_3

Muni_Rates_Total_W_Conc_4 = Muni_Rates_W_Conc_4*Floor_Area_W_Conc_4
Muni_Rates_Total_W_Conc_5 = Muni_Rates_W_Conc_5*Floor_Area_W_Conc_5

#Building Maintenance No Concessions

Maintenance_Building_WO_Conc_1 = Maintenance_Building*Floor_Area_WO_Conc_1-Levies_WO_Conc_1
Maintenance_Building_WO_Conc_2 = Maintenance_Building*Floor_Area_WO_Conc_2-Levies_WO_Conc_2
Maintenance_Building_WO_Conc_3 = Maintenance_Building*Floor_Area_WO_Conc_3-Levies_WO_Conc_3
Maintenance_Building_WO_Conc_4 = Maintenance_Building*Floor_Area_WO_Conc_4-Levies_WO_Conc_4
Maintenance_Building_WO_Conc_5 = Maintenance_Building*Floor_Area_WO_Conc_5-Levies_WO_Conc_5

#Building Maintenance With Concessions

Maintenance_Building_W_Conc_1 = Maintenance_Building*Floor_Area_W_Conc_1-Levies_W_Conc_1
Maintenance_Building_W_Conc_2 = Maintenance_Building*Floor_Area_W_Conc_2-Levies_W_Conc_2
Maintenance_Building_W_Conc_3 = Maintenance_Building*Floor_Area_W_Conc_3-Levies_W_Conc_3
Maintenance_Building_W_Conc_4 = Maintenance_Building*Floor_Area_W_Conc_4-Levies_W_Conc_4
Maintenance_Building_W_Conc_5 = Maintenance_Building*Floor_Area_W_Conc_5-Levies_W_Conc_5

#Total Monthly Expenses No Concessions

Expenses_Total_Monthly_WO_Conc_1 = Muni_Rates_Total_WO_Conc_1 + Maintenance_Building_WO_Conc_1
Expenses_Total_Monthly_WO_Conc_2 = Muni_Rates_Total_WO_Conc_2 + Maintenance_Building_WO_Conc_2
Expenses_Total_Monthly_WO_Conc_3 = Muni_Rates_Total_WO_Conc_3 + Maintenance_Building_WO_Conc_3
Expenses_Total_Monthly_WO_Conc_4 = Muni_Rates_Total_WO_Conc_4 + Maintenance_Building_WO_Conc_4
Expenses_Total_Monthly_WO_Conc_5 = Muni_Rates_Total_WO_Conc_5 + Maintenance_Building_WO_Conc_5

#Total Monthly Expenses With Concessions

Expenses_Total_Monthly_W_Conc_1 = Muni_Rates_Total_W_Conc_1 + Maintenance_Building_W_Conc_1
Expenses_Total_Monthly_W_Conc_2 = Muni_Rates_Total_W_Conc_2 + Maintenance_Building_W_Conc_2
Expenses_Total_Monthly_W_Conc_3 = Muni_Rates_Total_W_Conc_3 + Maintenance_Building_W_Conc_3
Expenses_Total_Monthly_W_Conc_4 = Muni_Rates_Total_W_Conc_4 + Maintenance_Building_W_Conc_4
Expenses_Total_Monthly_W_Conc_5 = Muni_Rates_Total_W_Conc_5 + Maintenance_Building_W_Conc_5

#UPFRONT EXPENSES:

#Estimated Land Cost

Expense_Land_1 = Parcel_Land_1*Parcel_Size_1
Expense_Land_2 = Parcel_Land_2*Parcel_Size_2
Expense_Land_3 = Parcel_Land_3*Parcel_Size_3
Expense_Land_4 = Parcel_Land_4*Parcel_Size_4
Expense_Land_5 = Parcel_Land_5*Parcel_Size_5

#Construction Cost No Concessions

Expense_Cnstrct_WO_Conc_1 =
Cnstrct_Resi*Floor_Area_Resi_Open_WO_Conc_1+Cnstrct_Office*Floor_Area_Office_WO_Conc_1+Cnstrct_Retail*Floor_Area_Retail_WO_Conc_1+Cnstrct_Parking*(Floor_Area_Resi_Parking_WO_Conc_1+Floor_Area_Office_Parking_WO_Conc_1+Floor_Area_Retail_Parking_WO_Conc_1)
Expense_Cnstrct_WO_Conc_2 =
Cnstrct_Resi*Floor_Area_Resi_Open_WO_Conc_2+Cnstrct_Office*Floor_Area_Office_WO_Conc_2+Cnstrct_Retail*Floor_Area_Retail_WO_Conc_2+Cnstrct_Parking*(Floor_Area_Resi_Parking_WO_Conc_2+Floor_Area_Office_Parking_WO_Conc_2+Floor_Area_Retail_Parking_WO_Conc_2)
Expense_Cnstrct_WO_Conc_3 =
Cnstrct_Resi*Floor_Area_Resi_Open_WO_Conc_3+Cnstrct_Office*Floor_Area_Office_WO_Conc_3+Cnstrct_Retail*Floor_Area_Retail_WO_Conc_3+Cnstrct_Parking*(Floor_Area_Resi_Parking_WO_Conc_3+Floor_Area_Office_Parking_WO_Conc_3+Floor_Area_Retail_Parking_WO_Conc_3)
Expense_Cnstrct_WO_Conc_4 =
Cnstrct_Resi*Floor_Area_Resi_Open_WO_Conc_4+Cnstrct_Office*Floor_Area_Office_WO_Conc_4+Cnstrct_Retail*Floor_Area_Retail_WO_Conc_4+Cnstrct_Parking*(Floor_Area_Resi_Parking_WO_Conc_4+Floor_Area_Office_Parking_WO_Conc_4+Floor_Area_Retail_Parking_WO_Conc_4)
Expense_Cnstrct_WO_Conc_5 =
Cnstrct_Resi*Floor_Area_Resi_Open_WO_Conc_5+Cnstrct_Office*Floor_Area_Office_WO_Conc_5+Cnstrct_Retail*Floor_Area_Retail_WO_Conc_5+Cnstrct_Parking*(Floor_Area_Resi_Parking_WO_Conc_5+Floor_Area_Office_Parking_WO_Conc_5+Floor_Area_Retail_Parking_WO_Conc_5)

#Construction Cost With Concessions

Expense_Cnstrct_W_Conc_1 = Cnstrct_Resi*Floor_Area_Resi_Total_W_Conc_1 + Cnstrct_Office*Floor_Area_Office_W_Conc_1 +
Cnstrct_Retail*Floor_Area_Retail_W_Conc_1 + Cnstrct_Parking*(Floor_Area_Resi_Parking_W_Conc_1 +
Floor_Area_Office_Parking_W_Conc_1 + Floor_Area_Retail_Parking_W_Conc_1)

#Total Upfront Income No Concessions

Income_Upfront_Total_WO_Conc_1 = Income_Resi_Sold_WO_Conc_1 + Income_Resi_Park_Sold_WO_Conc_1
 Income_Upfront_Total_WO_Conc_2 = Income_Resi_Sold_WO_Conc_2 + Income_Resi_Park_Sold_WO_Conc_2
 Income_Upfront_Total_WO_Conc_3 = Income_Resi_Sold_WO_Conc_3 + Income_Resi_Park_Sold_WO_Conc_3
 Income_Upfront_Total_WO_Conc_4 = Income_Resi_Sold_WO_Conc_4 + Income_Resi_Park_Sold_WO_Conc_4
 Income_Upfront_Total_WO_Conc_5 = Income_Resi_Sold_WO_Conc_5 + Income_Resi_Park_Sold_WO_Conc_5

#Total Upfront Income No Concessions

Income_Upfront_Total_W_Conc_1 = Income_Resi_Sold_W_Conc_1 + Income_Resi_Park_Sold_W_Conc_1
 Income_Upfront_Total_W_Conc_2 = Income_Resi_Sold_W_Conc_2 + Income_Resi_Park_Sold_W_Conc_2
 Income_Upfront_Total_W_Conc_3 = Income_Resi_Sold_W_Conc_3 + Income_Resi_Park_Sold_W_Conc_3
 Income_Upfront_Total_W_Conc_4 = Income_Resi_Sold_W_Conc_4 + Income_Resi_Park_Sold_W_Conc_4
 Income_Upfront_Total_W_Conc_5 = Income_Resi_Sold_W_Conc_5 + Income_Resi_Park_Sold_W_Conc_5

#PROJECT VIABILITY:

#Debt At Project Completion No Concessions (including interest accrued on loan and income from sold units)

Debt_Prjct_Complt_WO_Conc_1	=	Expense_Upfront_Total_WO_Conc_1*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_WO_Conc_1/Interest_Calc_Freq))			-
Income_Upfront_Total_WO_Conc_1			
Debt_Prjct_Complt_WO_Conc_2	=	Expense_Upfront_Total_WO_Conc_2*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_WO_Conc_2/Interest_Calc_Freq))			-
Income_Upfront_Total_WO_Conc_2			
Debt_Prjct_Complt_WO_Conc_3	=	Expense_Upfront_Total_WO_Conc_3*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_WO_Conc_3/Interest_Calc_Freq))			-
Income_Upfront_Total_WO_Conc_3			
Debt_Prjct_Complt_WO_Conc_4	=	Expense_Upfront_Total_WO_Conc_4*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_WO_Conc_4/Interest_Calc_Freq))			-
Income_Upfront_Total_WO_Conc_4			
Debt_Prjct_Complt_WO_Conc_5	=	Expense_Upfront_Total_WO_Conc_5*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_WO_Conc_5/Interest_Calc_Freq))			-
Income_Upfront_Total_WO_Conc_5			

#Debt At Project Completion With Concessions (including interest accrued on loan and income from sold units)

Debt_Prjct_Complt_W_Conc_1	=	Expense_Upfront_Total_W_Conc_1*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_W_Conc_1/Interest_Calc_Freq))			-
Income_Upfront_Total_W_Conc_1			
Debt_Prjct_Complt_W_Conc_2	=	Expense_Upfront_Total_W_Conc_2*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_W_Conc_2/Interest_Calc_Freq))			-
Income_Upfront_Total_W_Conc_2			
Debt_Prjct_Complt_W_Conc_3	=	Expense_Upfront_Total_W_Conc_3*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_W_Conc_3/Interest_Calc_Freq))			-
Income_Upfront_Total_W_Conc_3			
Debt_Prjct_Complt_W_Conc_4	=	Expense_Upfront_Total_W_Conc_4*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_W_Conc_4/Interest_Calc_Freq))			-
Income_Upfront_Total_W_Conc_4			
Debt_Prjct_Complt_W_Conc_5	=	Expense_Upfront_Total_W_Conc_5*(1.0	+
Interest_Rate/Interest_Calc_Freq)**(Interest_Calc_Freq*(Cnstrct_Dur_W_Conc_5/Interest_Calc_Freq))			-
Income_Upfront_Total_W_Conc_5			

#Property Equity At Project Completion No Concessions (Value of unsold portion of property minus debt - note using resi values for office and retail, advise to separate out)

Equity_WO_Conc_1	=	Parcel_WO_Conc_Sale_1*((1.0-
Perc_Resi_Sold_WO_Conc)*Floor_Area_Resi_Open_WO_Conc_1+Floor_Area_Office_WO_Conc_1+Floor_Area_Retail_WO_Conc_1)+Parcel_WO_Conc_Sale_1*((1.0-		
Perc_Resi_Sold_WO_Conc)*Floor_Area_Resi_Parking_WO_Conc_1+Floor_Area_Office_Parking_WO_Conc_1+Floor_Area_Retail_Parking_WO_Conc_1)-Debt_Prjct_Complt_WO_Conc_1		
Equity_WO_Conc_2	=	Parcel_WO_Conc_Sale_2*((1.0-
Perc_Resi_Sold_WO_Conc)*Floor_Area_Resi_Open_WO_Conc_2+Floor_Area_Office_WO_Conc_2+Floor_Area_Retail_WO_Conc_2)+Parcel_WO_Conc_Sale_2*((1.0-		
Perc_Resi_Sold_WO_Conc)*Floor_Area_Resi_Parking_WO_Conc_2+Floor_Area_Office_Parking_WO_Conc_2+Floor_Area_Retail_Parking_WO_Conc_2)-Debt_Prjct_Complt_WO_Conc_2		
Equity_WO_Conc_3	=	Parcel_WO_Conc_Sale_3*((1.0-
Perc_Resi_Sold_WO_Conc)*Floor_Area_Resi_Open_WO_Conc_3+Floor_Area_Office_WO_Conc_3+Floor_Area_Retail_WO_Conc_3)+Parcel_WO_Conc_Sale_3*((1.0-		
Perc_Resi_Sold_WO_Conc)*Floor_Area_Resi_Parking_WO_Conc_3+Floor_Area_Office_Parking_WO_Conc_3+Floor_Area_Retail_Parking_WO_Conc_3)-Debt_Prjct_Complt_WO_Conc_3		

$$\begin{aligned} & \text{Perc_Resi_Sold_WO_Conc}) * \text{Floor_Area_Resi_Parking_WO_Conc_3} + \text{Floor_Area_Office_Parking_WO_Conc_3} + \text{Floor_Area_Retail_Parking_} \\ & \text{WO_Conc_3}) - \text{Debt_Prjct_Complt_WO_Conc_3} \\ & \text{Equity_WO_Conc_4} = \text{Parcel_WO_Conc_Sale_4} * ((1.0 - \\ & \text{Perc_Resi_Sold_WO_Conc}) * \text{Floor_Area_Resi_Open_WO_Conc_4} + \text{Floor_Area_Office_WO_Conc_4} + \text{Floor_Area_Retail_WO_Conc_4}) + \text{Parcel_} \\ & \text{Sale_Parking_WO_Conc_4} * ((1.0 - \\ & \text{Perc_Resi_Sold_WO_Conc}) * \text{Floor_Area_Resi_Parking_WO_Conc_4} + \text{Floor_Area_Office_Parking_WO_Conc_4} + \text{Floor_Area_Retail_Parking_} \\ & \text{WO_Conc_4}) - \text{Debt_Prjct_Complt_WO_Conc_4} \\ & \text{Equity_WO_Conc_5} = \text{Parcel_WO_Conc_Sale_5} * ((1.0 - \\ & \text{Perc_Resi_Sold_WO_Conc}) * \text{Floor_Area_Resi_Open_WO_Conc_5} + \text{Floor_Area_Office_WO_Conc_5} + \text{Floor_Area_Retail_WO_Conc_5}) + \text{Parcel_} \\ & \text{Sale_Parking_WO_Conc_5} * ((1.0 - \\ & \text{Perc_Resi_Sold_WO_Conc}) * \text{Floor_Area_Resi_Parking_WO_Conc_5} + \text{Floor_Area_Office_Parking_WO_Conc_5} + \text{Floor_Area_Retail_Parking_} \\ & \text{WO_Conc_5}) - \text{Debt_Prjct_Complt_WO_Conc_5} \end{aligned}$$

#Property Equity At Project Completion With Concessions (Value of unsold portion of property minus debt - note using resi values for office and retail, advise to separate out)

$$\begin{aligned} & \text{Equity_W_Conc_1} = \text{Parcel_W_Conc_Sale_1} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Open_W_Conc_1} * \text{Sale_Factor_Open} + \text{Floor_Area_Office_W_Conc_1} + \text{Floor_Area_Retail_W_C} \\ & \text{onc_1}) + \text{Parcel_Sale_Parking_W_Conc_1} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Parking_W_Conc_1} + \text{Floor_Area_Office_Parking_W_Conc_1} + \text{Floor_Area_Retail_Parking_W_C} \\ & \text{onc_1}) + \text{Parcel_W_Conc_Sale_1} * \text{Floor_Area_Resi_Low_W_Conc_1} * \text{Rent_Factor_Low} + \text{Parcel_W_Conc_Sale_1} * \text{Floor_Area_Resi_Med_W_} \\ & \text{Conc_1} * \text{Rent_Factor_Med} - \text{Debt_Prjct_Complt_W_Conc_1} \\ & \text{Equity_W_Conc_2} = \text{Parcel_W_Conc_Sale_2} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Open_W_Conc_2} * \text{Sale_Factor_Open} + \text{Floor_Area_Office_W_Conc_2} + \text{Floor_Area_Retail_W_C} \\ & \text{onc_2}) + \text{Parcel_Sale_Parking_W_Conc_2} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Parking_W_Conc_2} + \text{Floor_Area_Office_Parking_W_Conc_2} + \text{Floor_Area_Retail_Parking_W_C} \\ & \text{onc_2}) + \text{Parcel_W_Conc_Sale_2} * \text{Floor_Area_Resi_Low_W_Conc_2} * \text{Rent_Factor_Low} + \text{Parcel_W_Conc_Sale_2} * \text{Floor_Area_Resi_Med_W_} \\ & \text{Conc_2} * \text{Rent_Factor_Med} - \text{Debt_Prjct_Complt_W_Conc_2} \\ & \text{Equity_W_Conc_3} = \text{Parcel_W_Conc_Sale_3} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Open_W_Conc_3} * \text{Sale_Factor_Open} + \text{Floor_Area_Office_W_Conc_3} + \text{Floor_Area_Retail_W_C} \\ & \text{onc_3}) + \text{Parcel_Sale_Parking_W_Conc_3} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Parking_W_Conc_3} + \text{Floor_Area_Office_Parking_W_Conc_3} + \text{Floor_Area_Retail_Parking_W_C} \\ & \text{onc_3}) + \text{Parcel_W_Conc_Sale_3} * \text{Floor_Area_Resi_Low_W_Conc_3} * \text{Rent_Factor_Low} + \text{Parcel_W_Conc_Sale_3} * \text{Floor_Area_Resi_Med_W_} \\ & \text{Conc_3} * \text{Rent_Factor_Med} - \text{Debt_Prjct_Complt_W_Conc_3} \\ & \text{Equity_W_Conc_4} = \text{Parcel_W_Conc_Sale_4} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Open_W_Conc_4} * \text{Sale_Factor_Open} + \text{Floor_Area_Office_W_Conc_4} + \text{Floor_Area_Retail_W_C} \\ & \text{onc_4}) + \text{Parcel_Sale_Parking_W_Conc_4} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Parking_W_Conc_4} + \text{Floor_Area_Office_Parking_W_Conc_4} + \text{Floor_Area_Retail_Parking_W_C} \\ & \text{onc_4}) + \text{Parcel_W_Conc_Sale_4} * \text{Floor_Area_Resi_Low_W_Conc_4} * \text{Rent_Factor_Low} + \text{Parcel_W_Conc_Sale_4} * \text{Floor_Area_Resi_Med_W_} \\ & \text{Conc_4} * \text{Rent_Factor_Med} - \text{Debt_Prjct_Complt_W_Conc_4} \\ & \text{Equity_W_Conc_5} = \text{Parcel_W_Conc_Sale_5} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Open_W_Conc_5} * \text{Sale_Factor_Open} + \text{Floor_Area_Office_W_Conc_5} + \text{Floor_Area_Retail_W_C} \\ & \text{onc_5}) + \text{Parcel_Sale_Parking_W_Conc_5} * ((1.0 - \\ & \text{Perc_Resi_Sold_W_Conc}) * \text{Floor_Area_Resi_Parking_W_Conc_5} + \text{Floor_Area_Office_Parking_W_Conc_5} + \text{Floor_Area_Retail_Parking_W_C} \\ & \text{onc_5}) + \text{Parcel_W_Conc_Sale_5} * \text{Floor_Area_Resi_Low_W_Conc_5} * \text{Rent_Factor_Low} + \text{Parcel_W_Conc_Sale_5} * \text{Floor_Area_Resi_Med_W_} \\ & \text{Conc_5} * \text{Rent_Factor_Med} - \text{Debt_Prjct_Complt_W_Conc_5} \end{aligned}$$

#Monthly Profit No Concessions

$$\begin{aligned} \text{Profit_Monthly_WO_Conc_1} &= \text{Income_Total_Monthly_WO_Conc_1} - \text{Expenses_Total_Monthly_WO_Conc_1} \\ \text{Profit_Monthly_WO_Conc_2} &= \text{Income_Total_Monthly_WO_Conc_2} - \text{Expenses_Total_Monthly_WO_Conc_2} \\ \text{Profit_Monthly_WO_Conc_3} &= \text{Income_Total_Monthly_WO_Conc_3} - \text{Expenses_Total_Monthly_WO_Conc_3} \\ \text{Profit_Monthly_WO_Conc_4} &= \text{Income_Total_Monthly_WO_Conc_4} - \text{Expenses_Total_Monthly_WO_Conc_4} \\ \text{Profit_Monthly_WO_Conc_5} &= \text{Income_Total_Monthly_WO_Conc_5} - \text{Expenses_Total_Monthly_WO_Conc_5} \end{aligned}$$

#Monthly Profit No Concessions

$$\begin{aligned} \text{Profit_Monthly_W_Conc_1} &= \text{Income_Total_Monthly_W_Conc_1} - \text{Expenses_Total_Monthly_W_Conc_1} \\ \text{Profit_Monthly_W_Conc_2} &= \text{Income_Total_Monthly_W_Conc_2} - \text{Expenses_Total_Monthly_W_Conc_2} \\ \text{Profit_Monthly_W_Conc_3} &= \text{Income_Total_Monthly_W_Conc_3} - \text{Expenses_Total_Monthly_W_Conc_3} \\ \text{Profit_Monthly_W_Conc_4} &= \text{Income_Total_Monthly_W_Conc_4} - \text{Expenses_Total_Monthly_W_Conc_4} \\ \text{Profit_Monthly_W_Conc_5} &= \text{Income_Total_Monthly_W_Conc_5} - \text{Expenses_Total_Monthly_W_Conc_5} \end{aligned}$$

#Yield No Concessions (Net Annual Income/Value of unsold building)

$$\begin{aligned} \text{Yield_WO_Conc_1} &= \text{Profit_Monthly_WO_Conc_1} * 12.0 / \text{Equity_WO_Conc_1} \\ \text{Yield_WO_Conc_2} &= \text{Profit_Monthly_WO_Conc_2} * 12.0 / \text{Equity_WO_Conc_2} \\ \text{Yield_WO_Conc_3} &= \text{Profit_Monthly_WO_Conc_3} * 12.0 / \text{Equity_WO_Conc_3} \\ \text{Yield_WO_Conc_4} &= \text{Profit_Monthly_WO_Conc_4} * 12.0 / \text{Equity_WO_Conc_4} \\ \text{Yield_WO_Conc_5} &= \text{Profit_Monthly_WO_Conc_5} * 12.0 / \text{Equity_WO_Conc_5} \end{aligned}$$

```

#Yield With Concessions (Net Annual Income/Value of unsold building)
Yield_W_Conc_1 = Profit_Monthly_W_Conc_1*12.0/Equity_W_Conc_1
Yield_W_Conc_2 = Profit_Monthly_W_Conc_2*12.0/Equity_W_Conc_2
Yield_W_Conc_3 = Profit_Monthly_W_Conc_3*12.0/Equity_W_Conc_3
Yield_W_Conc_4 = Profit_Monthly_W_Conc_4*12.0/Equity_W_Conc_4
Yield_W_Conc_5 = Profit_Monthly_W_Conc_5*12.0/Equity_W_Conc_5

#Years Till Loan Repayed No Concessions (relying on monthly profit to service debt)

if Profit_Monthly_WO_Conc_1 > 0.0:
    if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_1/Profit_Monthly_WO_Conc_1 < 1.0:
        Loan_Years_WO_Conc_1 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_1/Profit_Monthly_WO_Conc_1))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
    else:
        Loan_Years_WO_Conc_1 = 99999
else:
    Loan_Years_WO_Conc_1 = 0.0

if Profit_Monthly_WO_Conc_2 > 0.0:
    if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_2/Profit_Monthly_WO_Conc_2 < 1.0:
        Loan_Years_WO_Conc_2 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_2/Profit_Monthly_WO_Conc_2))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
    else:
        Loan_Years_WO_Conc_2 = 99999
else:
    Loan_Years_WO_Conc_2 = 0.0

if Profit_Monthly_WO_Conc_3 > 0.0:
    if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_3/Profit_Monthly_WO_Conc_3 < 1.0:
        Loan_Years_WO_Conc_3 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_3/Profit_Monthly_WO_Conc_3))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
    else:
        Loan_Years_WO_Conc_3 = 99999
else:
    Loan_Years_WO_Conc_3 = 0.0

if Profit_Monthly_WO_Conc_4 > 0.0:
    if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_4/Profit_Monthly_WO_Conc_4 < 1.0:
        Loan_Years_WO_Conc_4 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_4/Profit_Monthly_WO_Conc_4))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
    else:
        Loan_Years_WO_Conc_4 = 99999
else:
    Loan_Years_WO_Conc_4 = 0.0

if Profit_Monthly_WO_Conc_5 > 0.0:
    if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_5/Profit_Monthly_WO_Conc_5 < 1.0:
        Loan_Years_WO_Conc_5 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_WO_Conc_5/Profit_Monthly_WO_Conc_5))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
    else:
        Loan_Years_WO_Conc_5 = 99999
else:
    Loan_Years_WO_Conc_5 = 0.0

if Loan_Years_WO_Conc_1 < 0.0:
    Loan_Years_WO_Conc_1 = 0.0
else:
    Loan_Years_WO_Conc_1 = Loan_Years_WO_Conc_1

```

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if Loan_Years_WO_Conc_2 < 0.0:
    Loan_Years_WO_Conc_2 = 0.0
else:
    Loan_Years_WO_Conc_2 = Loan_Years_WO_Conc_2

if Loan_Years_WO_Conc_3 < 0.0:
    Loan_Years_WO_Conc_3 = 0.0
else:
    Loan_Years_WO_Conc_3 = Loan_Years_WO_Conc_3

if Loan_Years_WO_Conc_4 < 0.0:
    Loan_Years_WO_Conc_4 = 0.0
else:
    Loan_Years_WO_Conc_4 = Loan_Years_WO_Conc_4

if Loan_Years_WO_Conc_5 < 0.0:
    Loan_Years_WO_Conc_5 = 0.0
else:
    Loan_Years_WO_Conc_5 = Loan_Years_WO_Conc_5

#Years Till Loan Repayed With Concessions (relying on monthly profit to service debt)
if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_1/Profit_Monthly_W_Conc_1 < 1.0:
    Loan_Years_W_Conc_1 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_1/Profit_Monthly_W_Conc_1))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
else:
    Loan_Years_W_Conc_1 = 99999
if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_2/Profit_Monthly_W_Conc_2 < 1.0:
    Loan_Years_W_Conc_2 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_2/Profit_Monthly_W_Conc_2))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
else:
    Loan_Years_W_Conc_2 = 99999
if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_3/Profit_Monthly_W_Conc_3 < 1.0:
    Loan_Years_W_Conc_3 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_3/Profit_Monthly_W_Conc_3))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
else:
    Loan_Years_W_Conc_3 = 99999
if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_4/Profit_Monthly_W_Conc_4 < 1.0:
    Loan_Years_W_Conc_4 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_4/Profit_Monthly_W_Conc_4))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
else:
    Loan_Years_W_Conc_4 = 99999
if Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_5/Profit_Monthly_W_Conc_5 < 1.0:
    Loan_Years_W_Conc_5 = (-math.log10(1.0-Interest_Rate/Interest_Calc_Freq*Debt_Prjct_Complt_W_Conc_5/Profit_Monthly_W_Conc_5))/(math.log10(1.0+Interest_Rate/Interest_Calc_Freq))/12.0
else:
    Loan_Years_W_Conc_5 = 99999

if Loan_Years_W_Conc_1 < 0.0:
    Loan_Years_W_Conc_1 = 0.0
else:
    Loan_Years_W_Conc_1 = Loan_Years_W_Conc_1

if Loan_Years_W_Conc_2 < 0.0:
    Loan_Years_W_Conc_2 = 0.0
else:
    Loan_Years_W_Conc_2 = Loan_Years_W_Conc_2

if Loan_Years_W_Conc_3 < 0.0:
    Loan_Years_W_Conc_3 = 0.0
else:
    Loan_Years_W_Conc_3 = Loan_Years_W_Conc_3

```

```
if Loan_Years_W_Conc_4 < 0.0:
    Loan_Years_W_Conc_4 = 0.0
else:
    Loan_Years_W_Conc_4 = Loan_Years_W_Conc_4

if Loan_Years_W_Conc_5 < 0.0:
    Loan_Years_W_Conc_5 = 0.0
else:
    Loan_Years_W_Conc_5 = Loan_Years_W_Conc_5

print "
print Loan_Years_W_Conc_1
print Loan_Years_W_Conc_2
print Loan_Years_W_Conc_3
print Loan_Years_W_Conc_4
print Loan_Years_W_Conc_5
```

Module I – Code Execution

```
def main():
    pass

if __name__ == '__main__':
    main()

from Site_Configs_v2 import*
from Suburb_Data_v1 import*
from Raster_Data_Extract_v1 import*
from Initial_Site_Calculations_v1 import*
from Calculations_Floor_Area_v1 import*
from Calculations_Parking_v1 import*
from Additional_Site_Calculations_v1 import*
from Site_Finance_Calculations_v1 import*
import math
from datetime import datetime

filename = "\\Output_Table"+datetime.now().strftime(" %m-%d %H-%M");

file = open(r'C:\Users\Philip\OneDrive\Masters - EM017\CIV5000Z\GIS\Outputs'+filename+'.csv','w')

file.write("Parcel #;Parcel Size;Suburb;Zone (No Conc);Zone (With Conc);Parking Zone (No Conc);Parking Zone (With Conc);Floor Area Total (No Conc);Floor Area Total (With Conc);Floor Area Resi Open (No Conc);Floor Area Resi Open (With Conc);Floor Area Resi Low (No Conc);Floor Area Resi Low (With Conc);Floor Area Resi Med (No Conc);Floor Area Resi Med (With Conc);Floor Area Office (No Conc);Floor Area Office (With Conc);Floor Area Retail (No Conc);Floor Area Retail (With Conc);Floor Area Parking (No Conc);Floor Area Parking (With Conc);Land Cost;Construction Cost (No Conc);Construction Cost (With Conc);Construction Duration (No Conc);Construction Duration (With Conc);Monthly Profit (No Conc);Monthly Profit (With Conc);Income at Completion (No Conc);Income at Completion (With Conc);Debt at Completion (No Conc);Debt at Completion (With Conc);Bond Duration (No Conc);Bond Duration (With Conc);Equity at Completion (No Conc);Equity at Completion (With Conc);Yield (No Conc);Yield (With Conc)")

file.write("\n"+str(Site_Number_1)+';'+str(Parcel_Size_1)+';'+str(Suburb_Name_1)+';'+str(Parcel_Zone_1)+';'+str(Pref_LU_Zone_1)+';'+str(Parcel_Parking_Zone_1)+';'+str(Pref_Park_Zone_1)+';'+str(Floor_Area_WO_Conc_1)+';'+str(Floor_Area_W_Conc_1)+';'+str(Floor_Area_Resi_Open_WO_Conc_1)+';'+str(Floor_Area_Resi_Open_W_Conc_1)+';'+str(Floor_Area_Resi_Low_W_Conc_1)+';'+str(Floor_Area_Resi_Low_W_Conc_1)+';'+str(Floor_Area_Resi_Med_W_Conc_1)+';'+str(Floor_Area_Resi_Med_W_Conc_1)+';'+str(Floor_Area_Office_WO_Conc_1)+';'+str(Floor_Area_Office_W_Conc_1)+';'+str(Floor_Area_Retail_WO_Conc_1)+';'+str(Floor_Area_Retail_W_Conc_1)+';'+str(Floor_Area_Total_Parking_WO_Conc_1)+';'+str(Floor_Area_Total_Parking_W_Conc_1)+';'+str(Expense_Land_1)+';'+str(Expense_Cnstrct_WO_Conc_1)+';'+str(Expense_Cnstrct_W_Conc_1)+';'+str(Cnstrct_Dur_WO_Conc_1)+';'+str(Cnstrct_Dur_W_Conc_1)+';'+str(Profit_Monthly_WO_Conc_1)+';'+str(Profit_Monthly_W_Conc_1)+';'+str(Income_Upfront_Total_WO_Conc_1)+';'+str(Income_Upfront_Total_W_Conc_1)+';'+str(Debt_Prjct_Complt_WO_Conc_1)+';'+str(Debt_Prjct_Complt_W_Conc_1)+';'+str(Loan_Years_WO_Conc_1)+';'+str(Loan_Years_W_Conc_1)+';'+str(Equity_WO_Conc_1)+';'+str(Equity_W_Conc_1)+';'+str(Yield_WO_Conc_1)+';'+str(Yield_W_Conc_1)')

file.write("\n"+str(Site_Number_2)+';'+str(Parcel_Size_2)+';'+str(Suburb_Name_2)+';'+str(Parcel_Zone_2)+';'+str(Pref_LU_Zone_2)+';'+str(Parcel_Parking_Zone_2)+';'+str(Pref_Park_Zone_2)+';'+str(Floor_Area_WO_Conc_2)+';'+str(Floor_Area_W_Conc_2)+';'+str(Floor_Area_Resi_Open_WO_Conc_2)+';'+str(Floor_Area_Resi_Open_W_Conc_2)+';'+str(Floor_Area_Resi_Low_W_Conc_2)+';'+str(Floor_Area_Resi_Low_W_Conc_2)+';'+str(Floor_Area_Resi_Med_W_Conc_2)+';'+str(Floor_Area_Resi_Med_W_Conc_2)+';'+str(Floor_Area_Office_WO_Conc_2)+';'+str(Floor_Area_Office_W_Conc_2)+';'+str(Floor_Area_Retail_WO_Conc_2)+';'+str(Floor_Area_Retail_W_Conc_2)+';'+str(Floor_Area_Total_Parking_WO_Conc_2)+';'+str(Floor_Area_Total_Parking_W_Conc_2)+';'+str(Expense_Land_2)+';'+str(Expense_Cnstrct_WO_Conc_2)+';'+str(Expense_Cnstrct_W_Conc_2)+';'+str(Cnstrct_Dur_WO_Conc_2)+';'+str(Cnstrct_Dur_W_Conc_2)+';'+str(Profit_Monthly_WO_Conc_2)+';'+str(Profit_Monthly_W_Conc_2)+';'+str(Income_Upfront_Total_WO_Conc_2)+';'+str(Income_Upfront_Total_W_Conc_2)+';'+str(Debt_Prjct_Complt_WO_Conc_2)+';'+str(Debt_Prjct_Complt_W_Conc_2)+';'+str(Loan_Years_WO_Conc_2)+';'+str(Loan_Years_W_Conc_2)+';'+str(Equity_WO_Conc_2)+';'+str(Equity_W_Conc_2)+';'+str(Yield_WO_Conc_2)+';'+str(Yield_W_Conc_2)')

file.write("\n"+str(Site_Number_3)+';'+str(Parcel_Size_3)+';'+str(Suburb_Name_3)+';'+str(Parcel_Zone_3)+';'+str(Pref_LU_Zone_3)+';'+str(Parcel_Parking_Zone_3)+';'+str(Pref_Park_Zone_3)+';'+str(Floor_Area_WO_Conc_3)+';'+str(Floor_Area_W_Conc_3)+';'+str(Floor_Area_Resi_Open_WO_Conc_3)+';'+str(Floor_Area_Resi_Open_W_Conc_3)+';'+str(Floor_Area_Resi_Low_W_Conc_3)+';'+str(Floor_Area_Resi_Low_W_Conc_3)+';'+str(Floor_Area_Resi_Med_W_Conc_3)+';'+str(Floor_Area_Resi_Med_W_Conc_3)+';'+str(Floor_Area_Office_WO_Conc_3)+';'+str(Floor_Area_Office_W_Conc_3)+';'+str(Floor_Area_Retail_WO_Conc_3)+';'+str(Floor_Area_Retail_W_Conc_3)+';'+str(Floor_Area_Total_Parking_WO_Conc_3)+';'+str(Floor_Area_Total_Parking_W_Conc_3)+';'+str(Expense_Land_3)+';'+str(Expense_Cnstrct_WO_Conc_3)+';'+str(Expense_Cnstrct_W_Conc_3)+';'+str(Cnstrct_Dur_WO_Conc_3)+';'+str(Cnstrct_Dur_W_Conc_3)+';'+str(Profit_Monthly_WO_Conc_3)+';'+str(Profit_Monthly_W_Conc_3)+';'+str(Income_Upfront_Total_WO_Conc_3)+';'+str(Income_Upfront_Total_W_Conc_3)+';'+str(Debt_Prjct_Complt_WO_Conc_3)+';'+str(Debt_Prjct_Complt_W_Conc_3)+';'+str(Loan_Years_WO_Conc_3)+';'+str(Loan_Years_W_Conc_3)+';'+str(Equity_WO_Conc_3)+';'+str(Equity_W_Conc_3)+';'+str(Yield_WO_Conc_3)+';'+str(Yield_W_Conc_3)')

file.write("\n"+str(Site_Number_4)+';'+str(Parcel_Size_4)+';'+str(Suburb_Name_4)+';'+str(Parcel_Zone_4)+';'+str(Pref_LU_Zone_4)+';'+str(Parcel_Parking_Zone_4)+';'+str(Pref_Park_Zone_4)+';'+str(Floor_Area_WO_Conc_4)+';'+str(Floor_Area_W_Conc_4)+';'+str(Floor_Area_Resi_Open_WO_Conc_4)+';'+str(Floor_Area_Resi_Open_W_Conc_4)+';'+str(Floor_Area_Resi_Low_W_Conc_4)+';'+str(Floor_Area_Resi_Low_W_Conc_4)+';'+str(Floor_Area_Resi_Med_W_Conc_4)+';'+str(Floor_Area_Resi_Med_W_Conc_4)+';'+str(Floor_Area_Office_WO_Conc_4)+';'+str(Floor_Area_Office_W_Conc_4)+';'+str(Floor_Area_Retail_WO_Conc_4)'
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)+'+str(Floor_Area_Retail_W_Conc_4)+'+str(Floor_Area_Total_Parking_WO_Conc_4)+'+str(Floor_Area_Total_Parking_W_Conc_4)+'+s
tr(Expense_Land_4)+'+str(Expense_Cnstrct_WO_Conc_4)+'+str(Expense_Cnstrct_W_Conc_4)+'+str(Cnstrct_Dur_WO_Conc_4)+'+str(C
nstrct_Dur_W_Conc_4)+'+str(Profit_Monthly_WO_Conc_4)+'+str(Profit_Monthly_W_Conc_4)+'+str(Income_Upfront_Total_WO_Conc
_4)+'+str(Income_Upfront_Total_W_Conc_4)+'+str(Debt_Prjct_Complt_WO_Conc_4)+'+str(Debt_Prjct_Complt_W_Conc_4)+'+str(Loa
n_Years_WO_Conc_4)+'+str(Loan_Years_W_Conc_4)+'+str(Equity_WO_Conc_4)+'+str(Equity_W_Conc_4)+'+str(Yield_WO_Conc_4)+'
'+str(Yield_W_Conc_4)+'')
file.write('\n'+str(Site_Number_5)+'+str(Parcel_Size_5)+'+str(Suburb_Name_5)+'+str(Parcel_Zone_5)+'+str(Pref_LU_Zone_5)+'+str(P
arcel_Parking_Zone_5)+'+str(Pref_Park_Zone_5)+'+str(Floor_Area_WO_Conc_5)+'+str(Floor_Area_W_Conc_5)+'+str(Floor_Area_Resi
_Open_WO_Conc_5)+'+str(Floor_Area_Resi_Open_W_Conc_5)+'+N/A;'+str(Floor_Area_Resi_Low_W_Conc_5)+'+N/A;'+str(Floor_Area_Re
si_Med_W_Conc_5)+'+str(Floor_Area_Office_WO_Conc_5)+'+str(Floor_Area_Office_W_Conc_5)+'+str(Floor_Area_Retail_WO_Conc_5
)+'+str(Floor_Area_Retail_W_Conc_5)+'+str(Floor_Area_Total_Parking_WO_Conc_5)+'+str(Floor_Area_Total_Parking_W_Conc_5)+'+s
tr(Expense_Land_5)+'+str(Expense_Cnstrct_WO_Conc_5)+'+str(Expense_Cnstrct_W_Conc_5)+'+str(Cnstrct_Dur_WO_Conc_5)+'+str(C
nstrct_Dur_W_Conc_5)+'+str(Profit_Monthly_WO_Conc_5)+'+str(Profit_Monthly_W_Conc_5)+'+str(Income_Upfront_Total_WO_Conc
_5)+'+str(Income_Upfront_Total_W_Conc_5)+'+str(Debt_Prjct_Complt_WO_Conc_5)+'+str(Debt_Prjct_Complt_W_Conc_5)+'+str(Loa
n_Years_WO_Conc_5)+'+str(Loan_Years_W_Conc_5)+'+str(Equity_WO_Conc_5)+'+str(Equity_W_Conc_5)+'+str(Yield_WO_Conc_5)+'
'+str(Yield_W_Conc_5)+'')
file.close()

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